

COAL AGE

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REVOLUTIONARY PLANS

BY FLOYD W. PARSONS

Important coal measures are being perfected and will soon be made operative by the Fuel Administration.

Jobbers—

THERE IS a unanimity of opinion at Washington concerning jobbers. The determination is to do away entirely with coal speculation. Some jobbers will go out of business. Those having title to coal outputs will not. It is likely some small operators will be pleased to have certain jobbers finance and manage all coal sales. Local fuel administrators, however, when necessary will be the link binding the producer and the consumer together. Washington is aiming at a "mine-to-bin" route for coal.

Plans for Zoning Coal—

A ZONE SYSTEM will shortly be put into operation. Its purpose is to save transportation effort. Speaking generally, the plan will be based on the following principles: The country will be divided into three grand divisions—Eastern, Central and Western. The Eastern section will be supplied by the Allegheny coals. Roughly speaking, the Western limit of this Eastern zone will be the Ohio-Indiana line. All long rail hauls of these Allegheny coals will be eliminated, but this coal will be permitted to reach the Northwest by way of the Lakes. Byproduct gas coals and smithing coals will be permitted to go out of their zone in special cases.

The Central field will have as a western boundary a line between the Mississippi and the Missouri Rivers. This will create a sort of vacuum zone in the Western Mississippi Valley. Colorado, Wyoming, Iowa and the Southwest coal states will be called upon to supply the markets in this barren territory.

Illinois, Indiana and western Kentucky will be expected to increase shipments into the dock

or lake territory and into their own normal markets to replace the all-rail Eastern coals cut out.

Inside of the Central and Western zones will be smaller zones, limiting each shipper to short hauls. The net result will be a material gain in transportation facilities.

In the West the trouble has been lack of locomotives and cars, which this zoning will lessen. In the East the trouble has been chiefly due to congested gateways. Much Southern coal could have been gotten north had it not been for this trouble. New England has particularly suffered.

Right here it is worth noting that New England, however, did get more rail coal this winter than ever before, but the loss resulting from the Government taking away ships was not made up.

The details of the zoning scheme will be given out by the Fuel Administration shortly. It is certain, however, that the zone system adopted will be flexible, and that it will be made effective by embargoes. Changes will be made as necessity dictates. Enlargement of output will be encouraged.

Dirty Coal Remedy—

JOHN WHITE, representing the miners, has arrived at a perfect understanding with the Fuel Administration concerning dirty coal. Preventive measures will start with the miner. Fine or discharge will be handed the miner who loads impurities at the face. Operators failing to require clean loading will be recommended for closing down by district inspectors to be appointed. It is further likely that new price adjustments will recognize the ash problem and provide additional payment to operators who inaugurate methods (mechanical or otherwise) that result in producing a superior product.

IDEAS AND SUGGESTIONS

What Does the Future Hold in Store for the Coal-Mining Industry?

By CHARLES M. MEANS

Consulting Mining Engineer, Pittsburgh, Penn.

REGARDLESS of any price the Government may fix for coal during the period of the war, regardless of any price the economic conditions after the war may dictate, it is fully apparent that true efficiency will soon enter into the operation of all successful coal-mining plants.

Efficiency, in its ordinary accepted meaning, as applied to coal mining, has been lost sight of to a large degree because of the unusual conditions surrounding the industry. It has been a question of quantity, and as a general proposition the whole matter has been centered on how much coal can a certain mine produce. The margin between the cost of production and the selling price has been such that the finer features of economy could be passed up in favor of increased output. The industry is in such shape as to warrant a retrospective glance at what has happened; and, using the past three or four years as a guide, we may safely theorize as to what the future may have in store.

Beginning at a period just after war was declared in Europe, we find the coal industry at low ebb. From this condition we climbed to unheard-of prices, with maximum production in all fields. The cost of production increased, but at a much lower rate than the selling price. We reached a maximum insofar as selling price was concerned, and from that time the profits

have receded and will continue to recede. The cost of production did not follow the selling price, but continued to increase and is still on the upward trend. The time is inevitable when the cost of production will approximate the selling price. Then will come the reconstruction period, and only those operations that have properly protected themselves by efficient methods will weather the storm.

The tide has already started to go out; the margin of profit is growing less and less each month; and just as certain as we have reached the maximum profit period we will continue to take less and less margin until we again touch bottom. When this time will come is impossible to predict; but we must recognize that it is ahead, and that we are slowly and surely moving toward it.

This is certainly a time to consider trimming sails and applying such methods as will allow us to operate on a much-reduced margin of profit. The coal industry will never go back to the conditions existing during the prewar period, but will be stabilized on a new and different basis. Methods that were formerly successful must be thrown in the discard, and schemes must be worked out that will meet the inevitable changed problems we will be called upon to solve. Precedent cannot be followed, and a new and better way must be found and applied to the problems as they present themselves.

Practical Underground Motor Curves

By HARRY GOODNOW

DuQuoin, Ill.

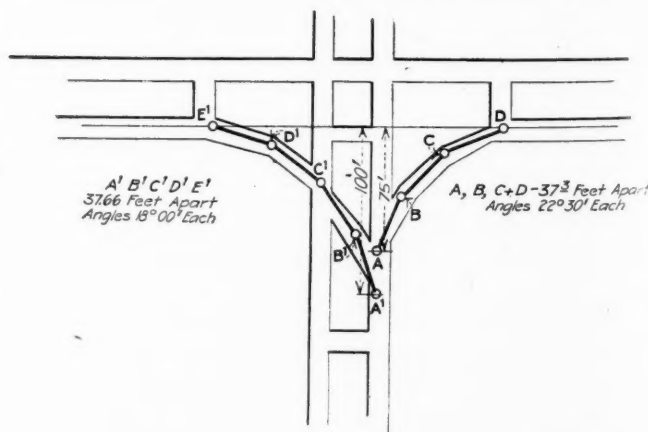
It is easy for the engineer to figure theoretical curves that will take a motor and trip at high speed without derailment, but to have new entries turned off that will contain such curves without making them too wide is a different matter.

To begin with, every cut of the machine must be planned in advance and a plain sketch with the sight lines and the ribs showing is nearly indispensable. This must be followed up with the surveyor's personal attention and the mine manager's hearty cooperation.

The following is a description and the accompanying drawing illustrates a pair of sub-main entries to be turned off, as usual, at an angle of 90 deg. from the main entries. This plan calls for three changes of sights and it will, in a 9- to 12-ft. entry, contain a regular curve of 92-ft. radius.

Plan to begin your curve at a point 75 ft. before reaching the theoretical sight line of the new entry.

At this point (called A) widen, toward the way you are going to turn, about 2 ft. in 6 and about 4 ft. in 12 ft. from A. Now put in a sight plug at A on the transit line of the main entry and, from A, turn an angle of $22\frac{1}{2}$ deg. toward the widened side, setting sights on



SUB-MAIN ENTRIES TO BE TURNED AT 90-DEG. ANGLE

this line. Run these sights to the face and mark off the rib of the new entry carefully. A hand-cutting on the ribs forming the acute angle between the two entries and from 4 to 6 ft. in will save cribbing or concreting later. The machine man (or pickman) can then proceed on both entries, being particularly careful in the running of his sights.

At a distance of 37.3 ft. from A begin to angle the new entry a trifle more till past far enough to set the plug B at the distance of 37.3 from A. From B turn $22\frac{1}{2}$ deg. more from the line AB. Repeat this at C and D 37.3 ft. more each. DE will then be on the true course of the new entry and D will be at a latitude of 75 ft. and a departure of 75 ft. from A.

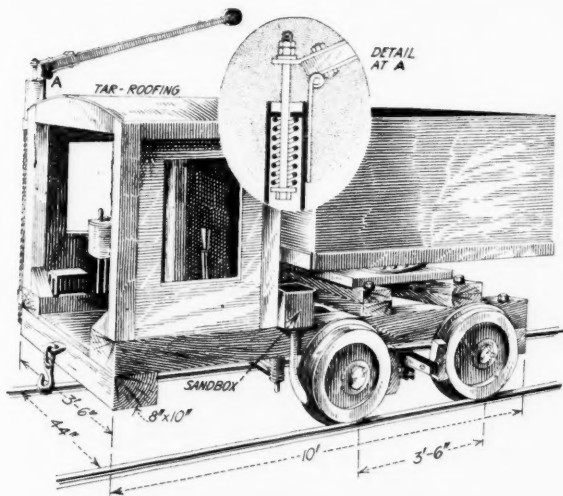
With the new "back" entry turned in its normal place and run in, the first crosscut (at 60 ft.) will have, within a few feet, its normal pillar to the haulage road.

With this system you have lost a few feet of extra yardage and a few hours' thought and watching while you have gained a narrow entry which will contain a regular curve. This method, to my knowledge, has been tried out successfully at two mines at least.

A combination of the foregoing curve with one where the point A is 100 ft. from the proposed course and turned with four changes of sight lines each angled 18 deg. for a distance of 37.66 ft. will keep the switches separate where you wish to turn your entries both ways from the main. This tunnel will contain a curve of 120-ft. radius.

A Homemade "Dirt Motor"

The superintendent of a mine "somewhere in Ohio" stood watching five or six men struggling to push a loaded dirt truck out onto the dump. It took these men 10 min. to dispose of two tons of slate and refuse. He probably said to himself something like this: "It is



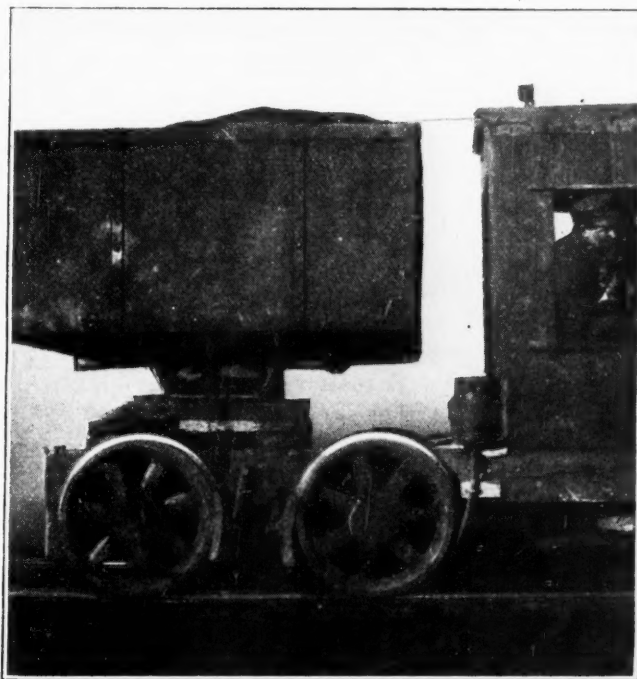
DETAILS OF HOMEMADE DIRT MOTOR

costing us a lot of money to move this dirt, both in time and in the stopping of coal hoisting. I have all the old material that we need. I'm going to build a motor that will do this work, and other things besides." This man usually does what he thinks necessary, so in a few days the "dirt motor" shown in the accompanying illustrations was made.

The frame as shown is built up of 8 x 10-in. oak; the

cab is built of 2 x 4-in. pine and common house siding; the platform for the turntable is made of $2\frac{1}{2}$ x 8-in. oak. The trucks are a pair that was discarded from a 6-ton gathering locomotive; the motor (about 25-hp.) is also from a 6-ton locomotive. A Westinghouse controller is used, in series with a cast-iron grid resistance. The trolley connection is homemade throughout, except the trolley wheel.

The dirt box (see dimensions in drawing) is constructed of $\frac{1}{4}$ -in. sheet iron. This is mounted upon a



VIEW OF HOMEMADE DIRT MOTOR

turntable with a ball joint and roller bearings, the rollers being short pieces of $1\frac{1}{4}$ -in. pipe. This box, which holds about 4 tons, can be dumped from three positions. Refuse from the mine is deposited directly into a chute and thence into the dirt box.

Besides removing all the dirt, one man handles all the boiler coal, house coal, ashes from the boiler house, and does many other things too numerous to mention. This larry has paid for itself many times over. The only item of expense for repairs in two years has been two new trolley wheels.

Weight of Cement and Concrete

The following information is taken from "The Ramsey Book—How To Make and How To Use Concrete":

	Lb.
Portland cement weighs per barrel, net.....	376
Portland cement weighs per bag, net.....	94
Natural cement weighs per barrel, net.....	282
Natural cement weighs per bag, net.....	94
Loose portland cement weighs per cubic foot, about...	92
Portland cement mortar (1:2½) weighs per cubic foot, about	135
Portland cement concrete weighs per cubic foot, about	130
Cinder concrete weighs per cubic foot, about.....	112
Conglomerate concrete weighs per cubic foot, about...	150
Gravel concrete weighs per cubic foot, about.....	150
Limestone concrete weighs per cubic foot, about.....	148
Sandstone concrete weighs per cubic foot, about.....	143
Trap concrete weighs per cubic foot, about.....	155

The Canal as a Carrier of Coal

By W. W. WOTHERSPOON

State Superintendent of Public Works, Albany, N. Y.

THE Federal Fuel Administrator recently stated that there was 20,000,000 tons of coal at the mines that could not be distributed on account of the inadequacy of railroad equipment. Prominent railroad authorities have stated that the widespread coal famine does not result so much from decreased production and increased consumption as it does from a shortage of cars.

The United States Geological Survey recently announced that soft coal operators during one week in July produced 76.5 per cent. of their capacity. The inadequacy of railroad facilities are blamed for 12 per cent. of the 24 per cent. shortage from maximum.

It is evident, therefore, that the coal problem is a matter of distribution rather than production, and the solution must be reached by increasing the means of distribution and obtaining the greatest efficiency from present facilities.

According to the United States Geological Survey, in a booklet entitled "Coal in 1915," treating with distribution and consumption, coal reaches the markets from producing areas by three general methods of transportation: (1) All rail; (2) rail to tidewater, thence coastwise to coast ports; (3) rail to Great Lakes, thence via lakes to lake ports. Considering the subject from the standpoint of New York State consumers, the second and third methods may be dismissed. From the statistics published by the Geological Survey, it is shown that little of the coal routed to tidewater or to the Great Lakes comes into New York State.

Of all states producing coal, it is shown by the investigation of the Geological Survey that the states of Maryland, Ohio and West Virginia were the only producing areas delivering coal in New York State markets aside from Pennsylvania. Pennsylvania is the greatest coal-producing state in the country. Bordering New York on the south, with its mines in close proximity to the dense population and intense industrial activity in New York, it is natural that Pennsylvania coal should be consumed in great volume here.

Statistics for 1915 show that although Pennsylvania was its own best customer, New York State ranked next, consuming more Pennsylvania coal than any other single state. Out of a total of 157,955,137 tons of bituminous coal produced in Pennsylvania in 1915, there was over 14,000,000 tons shipped into New York State, or something over 8 per cent.

Pennsylvania produced 88,995,061 tons of anthracite in 1915, of which over 20,000,000 tons was shipped into New York. This tonnage moved entirely by rail. Therefore, the first method of transportation mentioned

by the Geological Survey (all rail) has been the only means of distributing Pennsylvania coal in New York.

With the completion of the improved canals another route and means of distribution is provided. The canal system extends from Buffalo at Lake Erie on the west, to the Hudson River on the east. To the north, it reaches Lake Ontario at Oswego, and the St. Lawrence River through the Champlain Division, Lake Champlain and connecting Canadian waterways.

Near the exact center of the state, the Erie, or

main east and west channel, makes connection with the Cayuga and Seneca Division. This section runs southward connecting Lakes Cayuga and Seneca. Watkins, on Seneca Lake, and Ithaca, on Cayuga Lake, are the two terminals of the canal system nearest the bituminous and anthracite coal fields of Pennsylvania.

A rail haul of less than 30 miles from New York-Pennsylvania state line makes connection with the canal system

at points about equidistant from its western, northern and eastern termini.

To all that section of the state between Buffalo on the west, Oswego on the north and Albany on the east, on the line of the canal, the average water haul is 165 miles from Watkins and 143.4 miles from Ithaca.

Of the 157,955,137 tons of bituminous coal produced in Pennsylvania in 1915, 83,698,389 tons was transported by rail. The Pennsylvania R.R. transported 57,059,578 tons, or about 68 per cent., and the New York Central 8,337,868 tons, or about 10 per cent. These two lines were the largest bituminous coal carriers.

There are no statistics available as to the portion of Pennsylvania anthracite production transported by individual railroads, but the five railroads operating from the anthracite fields of Pennsylvania and making connection with the canal system at various points between Buffalo and Albany carried 43,951,145 tons of anthracite coal in the year ended June, 1916.

It is shown by the United States Geological Survey that 14,430,879 tons of Pennsylvania bituminous coal was consumed in New York State in 1915. This is exclusive of railroad coal and bunker fuel for ocean vessels and steamships on the Great Lakes.

Since the Pennsylvania R.R. transported 68 per cent. and the New York Central 10 per cent. of the total bituminous coal mined in Pennsylvania and moved by all-rail routes to other states, it is reasonable to assume that these two roads would participate to the same degree in bituminous coal moved into New York State. On this basis, the coal tonnage of the Pennsylvania R.R.

A SURVEY of the commercial possibilities of the improved canal system of New York reveals a very important feature of the canal operation that is of statewide interest; namely, the ability of the improved canals to transport a large portion of the coal, both anthracite and bituminous, consumed in this state.

At the present moment, when the coal situation is commanding nation-wide attention, any medium that offers even a partial solution of this big and vital problem is deserving of serious consideration and should be utilized in the fullest measure, whenever and wherever available.

from the Pennsylvania bituminous fields into New York State would have been about 9,813,009 tons. The New York Central tonnage would have been about 1,443,000 tons, but inasmuch as it appears the Pennsylvania R.R. is the controlling factor in the movement of Pennsylvania bituminous coal, the traffic of the Pennsylvania R.R. alone will be considered.

It is difficult to estimate the anthracite tonnage that was transported into New York State by each of the five hard-coal roads. The percentage of each line to the total tonnage transported, if applied to the New York State consumption would, however, give the following approximate basis:

	Per Cent.	Total Tonnage
Lehigh Valley.....	30.5	6,340,795.67
Delaware, Lackawanna & Western.....	23.2	4,833,162.61
Delaware & Hudson.....	22.5	4,677,636.15
Erie.....	18.7	3,887,635.38
New York, Ontario & Western.....	5.1	1,060,264.19
Totals.....	100.0	20,789,404.00

On movement of coal from the Pennsylvania bituminous fields via Pennsylvania R.R. into New York State, by far the greatest area of the state is served by the joint Pennsylvania and New York Central routes. The junction of the New York Central and Pennsylvania railroads at which there is the greatest coal interchange and through which the greatest area is served is at Himrods, N. Y., a point about 15 miles south of Watkins, N. Y., the canal terminal at the southern extremity of Seneca Lake. Soft coal taken from the Pennsylvania R.R. at Himrods Junction destined to points on the line of the New York Central between Buffalo and Albany, is carried by the New York Central over its Pennsylvania Division northward to Lyons, thence east and west of Lyons to all points on the main line. This all-rail route practically parallels the canal route via the Cayuga-Seneca and Erie canals from Watkins.

The route of the anthracite movement also closely follows the route of the canal. Via the Lehigh Valley R.R., anthracite is delivered to lines serving the territory intermediate to Albany and Buffalo at Weedsport, Geneva and Canastota, N. Y. Via Delaware, Lackawanna & Western R.R., the point of interchange is at Syracuse and Utica. Over the New York, Ontario & Western R.R., the interchange may be made at Oneida and Utica. Excepting Canastota and Oneida, all of the interchange points named are ports on the canal system. On Lehigh Valley traffic via Geneva, the coal is carried through Ithaca, the canal terminal at the southern extremity of Cayuga Lake.

The source of the greatest bituminous production in Pennsylvania is said to be in the Clearfield District. Altoona, Penn., is about the geographical center of this area. From Altoona to that section of New York State between Albany and Buffalo and as far north as Oswego, the average rail haul is about 317 miles. On the assumption that the average car-mile movement is about 20 miles per day, an average 317-mile haul would require about 30 days per car per round trip.

An annual movement of 9,813,000 tons is an average monthly tonnage of 817,750 tons. This tonnage, on the average loading of 50 tons per car, would require 16,355 cars per month for its transportation. As it takes a car 30 days to make a round trip, that number of cars must be constantly in service.

Suppose, however, instead of routing the bituminous coal via the all-rail route into New York, it was hauled by rail to Watkins, N. Y., and thence transported by canal into the same consuming areas.

Watkins is about 190 miles from Altoona. At 20 miles per day a car may make a round trip between Altoona and Watkins in 20 days. It requires 30 days via the all-rail route. Therefore, the same amount of coal could be transported from the bituminous fields to Watkins for distribution via canal in New York State with two-thirds the number of cars required by the all-rail movement. This car saving would amount to over 5000 cars per month.

The Scranton-Wilkes-Barre District is about the geographical center of the Pennsylvania anthracite fields. The shortest rail mileage from the anthracite region to a point of connection with the canal via each of the five hard coal roads is:

	Miles
Via Delaware, Lackawanna & Western to Ithaca.....	113.0
Via Lehigh Valley to Ithaca.....	128.0
Via New York, Ontario & Western to Utica.....	169.2
Via Delaware & Hudson to Schenectady.....	194.0
Via Erie to Rochester.....	254.0

As a distributing medium, the routes via the Delaware & Hudson, the Erie, and the Ontario & Western do not seem practicable insofar as the average rail and water haul to the territory between Buffalo and Albany via these routes greatly exceeds the haul through the Lehigh Valley and Lackawanna railroads connecting with the canal at Ithaca. In demonstrating the ability of the waterway to transport the anthracite tonnage, therefore, the shortest and direct routes only are taken into consideration.

TWENTY-THREE DAYS FOR ROUND TRIP

From Scranton to the section of the state between Albany and Buffalo and northward to Oswego, the average all-rail haul via the Lehigh Valley and Delaware, Lackawanna & Western railroads is approximately 231 miles. On a 20-mile per day car movement a round trip would average 23 days. The anthracite tonnage under consideration aggregated 20,789,404. This represents approximately 1,732,450 tons per month. On the 50-ton per car basis, this volume would require about 34,649 cars per month. Since it takes an average of 23 days for a round trip, 26,565 cars must therefore be constantly in service in order to transport this volume of tonnage.

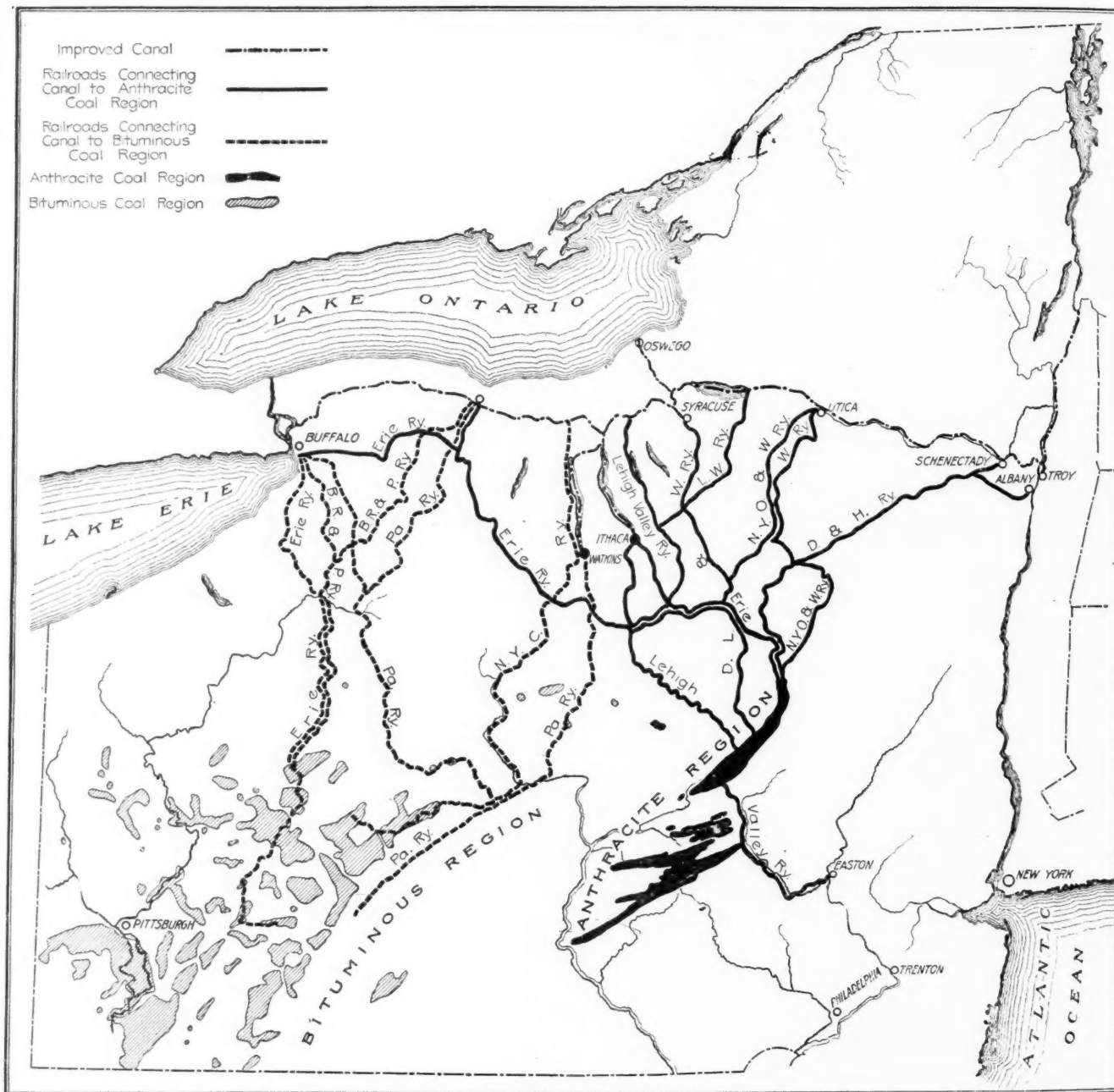
If the anthracite tonnage were carried by rail to the point of interchange with the canal, an average rail haul of 120 miles is involved. The 20-mile per day car movement would entail 12 days per round trip. This results in a car saving of nearly 50 per cent. and would conserve over 13,000 cars per month.

A utilization of the canal for the transportation of anthracite and bituminous coal to the extent indicated would therefore result in a conservation of over 18,000 cars monthly, and the equipment thus conserved might transport 900,000 tons of coal per month to other territories not accessible via water routes. During the seven months' season of navigation, the conservation of so large a number of cars would augment the railroad facilities to an extent greater than demand for the distribution of the 20,000,000 tons which the Fuel Administrator states cannot be transported on account of the car shortage to territories where it is sorely needed.

The 317-mile average all-rail haul on the annual bituminous tonnage creates a ton mileage per month of 259,226,750 ton-miles. On the anthracite tonnage with an average all-rail haul of 231 miles, the ton mileage monthly would be 400,195,950 ton-miles.

If the bituminous were routed via canal through Watkins, the ton mileage would be decreased to 155-372,500 ton-miles. A canal routing via Ithaca on anthracite coal would decrease the anthracite ton mileage to 207,894,000 ton-miles. This represents a

The canals are limited in their capacity only by the quantity of water utilized in operating the locks. Between the Cayuga-Seneca and Erie divisions of the improved canal system there are four locks, two combined at Seneca Falls, one each at Waterloo and Cayuga. It is known that the available water supply will permit the passing of boats through these locks at least once every half hour. The lock chambers on the enlarged canal can accommodate five of the old-type 240-ton boats with their towing tug at one time. Operated 48 times



THE solution of the coal problem confronting the majority of New York State industries is in their own hands. A maximum utilization of the canal facilities and the fullest measure of cooperation and support on the part of shippers is all that is necessary. In the protection of their own interests, as a measure of relief to other territories not accessible by water routes, and as a patriotic duty, the canal should be used to the very limit of its capacity. This map describes the rail and canal routes cited in Mr. Wotherspoon's article.

monthly ton-mile decrease of 296,156,200 ton-miles and during a seven months' season of navigation would total 2,073,093,400 ton-miles.

The coal traffic of the rail lines for a seven months' period of canal navigation would aggregate about 17,850,000 tons. Let us consider whether the canal can physically accommodate this large tonnage volume.

a day, they may accommodate 240 boats with a carrying capacity of 57,600 tons per day. During the season of canal navigation, the Cayuga-Seneca canal is capable of transporting 12,376,000 tons or almost 75 per cent. of the total tonnage of the rail lines.

This estimate is based on the utilization of the Cayuga-Seneca canal exclusively, while it is quite prob-

able a large coal traffic might be developed through other ports of transshipment, such as Syracuse, Utica or Weedsport, which are on the Erie Division. In view of the ability of the Cayuga-Seneca Division to transport 75 per cent. of the rail-borne coal traffic during the season of navigation, there is no question but the remaining 25 per cent. could be cared for through other rail and canal routes. It seems evident that the improved canal system can readily accommodate the entire bituminous and anthracite coal tonnage.

It is apparent that a utilization of the canals would materially relieve the coal and car shortage, but there are still other benefits that may be realized by the diversion of this volume of coal from the rail to the canal route.

Exclusive of the actual shortage of cars, the inability of the railroads to move cars promptly is a perplexing problem confronting railroad managers. It cannot be disputed that a conservation of 18,000 cars per month, made possible by the use of the canal for the coal traffic, would appreciably relieve the condition. Since an engine may haul perhaps 100 loaded coal cars, the conservation of locomotives would amount to 180 monthly. The benefits which would arise from the adoption of the plan would be almost incalculable.

When every foot of track in yards and terminals is at a premium, the withdrawal of 18,000 cars per month for seven months in the year releases over 850 miles of track for other service. This is the equivalent of 850 miles of new track and its value is beyond reckoning.

USE OF CANAL MEANS ECONOMY IN COSTS

The third advantage to be derived from a utilization of the canal for coal transportation and what perhaps is of the greatest interest to the consumer is the economy in transportation costs. The average rail rate on bituminous coal from the Clearfield District to the area in New York State between Buffalo and New York is \$2.02 per ton. For the average haul of 317 miles this rate yields a ton-mile rate of 6.3 mills. The Pennsylvania R.R. publishes a rate of \$1.48 per ton on soft coal from the Clearfield district to Watkins for transshipment. This rate yields 7.7 mills per ton-mile.

It is believed coal may be profitably transported in large volume via the canal at a rate of 2 mills per ton-mile. The average water haul from Watkins being 165 miles, an average canal rate from Watkins would be 33c. per ton. A 33c. canal rate plus the rail rate of \$1.48 from mines to Watkins makes a through charge of \$1.81, exclusive of terminal charges. These are an unknown factor but should not materially increase the through charge if modern and economical transshipping machinery were provided.

Eliminating terminal charges, however, it is seen that the joint rail and canal route creates a saving in the cost of transportation per ton on bituminous coal of 41c. and this, in spite of the fact the rail rate to Watkins exceeds the average rail rate to points between Buffalo and Albany by 1.4 mills per ton-mile. If the rate to Watkins was constructed on the 6.3 mills per ton-mile basis yielded by the average all-rail rate, the result would be a rate from the mines to Watkins

of \$1.21 and it would increase the saving in the rail and canal route to 68c. per ton.

The average rail rate on anthracite coal from Pennsylvania fields to the territory in question is \$1.947 per ton. The average rail haul is 231 miles. This yields a ton-mile rate of 8.4 mills. The hard-coal roads do not publish transshipping rates to points of interchange with the canal that are appreciably lower than the local rate as is the case via Pennsylvania R.R. from the Pennsylvania bituminous fields to Watkins, N. Y. However, if rates were put into effect from the anthracite region to Ithaca, based on the average 8.4 mills per ton-mile all-rail anthracite rate, on the average rail haul of 120 miles, the result would be a rate of \$1.108 per ton. A two-mill per ton-mile canal rate on the average canal mileage of 113 miles from interchange points to territory between Buffalo and Albany yields a rate of 22.6c. per ton. This combination would make a through rail and canal rate of \$1.334, or 61.3c. less than the all-rail rate exclusive of terminal charges.

WOULD REQUIRE CONSTANT SERVICE OF 1062 BOATS

The foregoing shows that the utilization of the rail and canal route would result in a saving in the transportation cost of 68c. per ton on bituminous coal and 61.3c. per ton on anthracite coal. On the aggregate bituminous and anthracite tonnage for the seven months this saving per ton would amount to over \$11,000,000.

The problem of supplying a sufficient number of boats is the only obstacle in the way of the immediate utilization of the rail and canal route. It, however, is not difficult of solution. The average canal haul to the territory between Buffalo and Albany from the various possible points of transshipment is about 115 miles. Assuming boats will proceed 4 miles per hour, on the average, a round trip can be made in three days at the most. A movement of 17,850,000 tons of coal during the season of navigation means a daily tonnage of 85,000 tons. To transport such amount of coal each day would require 354 boats of the 240-ton type. On the basis of a three-day schedule, the traffic would require the constant service of 1062 boats. The census made by the Superintendent of Public Works during 1917 showed there were approximately 675 canal boats in service. These, to a great extent, were boats of the old type, unsuited for the carrying of grain or other high-grade commodities. They are, however, well adapted for the coal trade.

If all the present boats were utilized, the movement of the total coal tonnage under consideration would require approximately 387 additional boats of a 240-ton capacity. The type of boat required is simple in design and cheap of construction. A sufficient additional number of wooden boats could be built with little or no delay. Should the new barges be of larger dimensions a less number would be needed.

That the industrial interests of New York State once recognized the opportunities afforded by the canal in the transportation of coal is apparent from the statistics of canal commerce of a few decades ago. Over a million and one-half tons of coal have been transported on the canals of New York in a single season.

Why this commerce passed from the canals to the railroads is readily explained. The first cause, no doubt,

was the lack of modern and properly equipped terminals on the canal. A second factor was the convenience offered big consumers by the railroads in providing private sidetracks, thus enabling the factories to unload at their plant. A third and most potent contributing cause was the inefficient and undependable service provided by the individual boat owner. Big shippers found the boat owner here today and gone tomorrow. When there was an urgent need of boats none were to be had. All of these expensive and unsatisfactory conditions, abetted undoubtedly by railroad competition and discriminatory railroad rates, forced the coal traffic from the state waterways.

In the season of 1917, despite the urgent need of manufacturers and the inability of the railroads to adequately serve their needs, but 234,941 tons of coal was carried on the canals, and practically none over the Cayuga-Seneca Division.

The transportation situation now existing demands that the commercial and manufacturing interests awaken to the peril that threatens them. The railroads must be augmented by every available means of transportation if they are to survive the burden imposed on them and efficiently serve the nation at this most critical period. The improved canal system of New York State is the finest substitute for rail transportation available.

There is no reason why a large portion of the bituminous and anthracite coal consumed in the state should not be transported by the canals. The conditions influencing the routing of coal via the rail routes have been entirely overcome in the construction of the new canal. Terminals are available for service at practically every port of the canal system. They have been or will be equipped with devices for the speedy and economical handling of the traffic. If the coal traffic warrants special machinery it can be provided. Coal may be unloaded from barges, loaded to cars and switched to industries at a comparatively small cost. The state and Federal laws provide for this.

If it could be assured that the coal consumed in New York would be routed via the canal, no reason exists why boats capable of transporting coal to the canal's capacity should not be speedily constructed. Under capable management the requirements of all could be adequately and efficiently served. The coal-carrying boats, to render the maximum of service, should be under some central ownership or control. The railroads now voluntarily offer to cooperate with dependable water lines. Destructive railroad competition need no longer be feared. If rates are discriminatory, the state and Federal commissions are empowered to take summary action.

With the routing of coal through the canal assured, and with the necessary boats in existence, the only facilities then lacking would be temporary storehouses, coal trestles, or other structures or devices which would permit the cheap and prompt transfer of coal from car to barge. No difficulties exist in the providing of these facilities to men who earnestly take up the proposition.

In the case of export coal, it is believed canal barges may transport coal from transshipping in central New York to shipside in New York harbor, thus eliminating transshipment and lighterage now required in the exportation of coal through New York and appreciably relieving the harbor congestion.

Work of Labor Divisions of War Administration Coordinated

Upon the recommendation of the Advisory Council, created to report on the handling of industrial relations growing out of the war, the Secretary of Labor has arranged for the coördination of the industrial service (labor) activities being developed in the various purchasing and supervisory offices of the war administration. Simultaneously a number of new bureaus have been established and will assume the coördinating functions.

A well-developed industrial service division is in operation in the Ordnance Department and similar organizations are being worked up in the other purchasing and supervisory branches of the War Department as well as in the Navy Department and the Shipping Board. These bodies are all developing plans for accomplishing similar results in their own given departments. In some cases they might, if not coördinated, work to cross purposes, and in any of their activities exchange of views on methods is desirable. The necessary machinery for getting together is now provided by the action of the Secretary of Labor. The following new bureaus are established to effect the desired coördination:

1. Adjustment Bureau—to deal with disputes.
2. Condition of Labor Bureau—to administer conditions of labor within business plants, such as safety, sanitation, etc.
3. Information and Education Bureau—to promote sound sentiment and to provide appropriate local machinery and policies in individual plants.
4. Women in Industry Bureau—to correlate the activities of various agencies dealing with this matter.
5. Training and Dilution Bureau.
6. Bureau of Housing and Transportation of Workers.
7. Bureau of Personnel (which may possibly be fused with the Information and Education Bureau).

The present United States Employment Service will act as the coördinating bureau on the procurement of labor.

For Our Forthcoming Success Number

Genius is the nice adaptation of means to ends. It does not so much consist in size as in ingenuity and suitability. We wish our readers to send us accounts of the way in which they have solved their puzzles. If this was not done in elaborate and costly ways, so much the better, for most of us have not the wherewithal to attempt either elaborate or costly devices.

We are looking for kinks and schemes which saved money, increased output, avoided troubles and protected life and limb so that by publication those methods may save for our readers what they saved for the writer. It will be a pleasing task to write the record of some success for our Success Number and, moreover, *Coal Age* is quite willing to pay for it. So if there is a successful performance on your mind, let *Coal Age* have it so that it may spread the good tidings and incidentally furnish the writer with some spending money. Photographs and drawings of the methods adopted will be more than welcome. The Annual Success Number will be issued Apr. 13, and all manuscript should be in our hands not later than Mar. 25.

Supporting the Roof in Coal Mines—II

By R. D. BROWN
Harrisburg, Ill.

SYNOPSIS—Illustrates designing of timber sets by formula, working out several cases, covering round and square timber. The different methods of timber preservation are discussed and the advantages and disadvantages noted. The cost of timbering is tabulated; also the safe loads for square beams and the comparative strength of various woods.

TWO general principles, or conditions, affect the design and erection of timber sets. First, the weight to be supported is an unknown variable quantity; second, the scarcity of skilled labor may make the adoption of a simple standard design necessary for both economy and safety. The design of the common three-piece set, illustrated in Figs. 7 to 11 inclusive, is not ordinarily based on mathematical calculations. However, if the expected weight may be approximated, the size of the section, or diameter of collar, may be computed by the use of the following formulas. For round timber collars the formula is

$$W = 0.065S \frac{d^3}{l} \quad (1)$$

in which

W = Safe load in pounds;

d = Least diameter of collar in inches;

l = Length of clear span in feet;

S = Safe unit fiber stress for seasoned timbers in pounds per square inch.

Safe unit fiber stress for seasoned white oak is 1200 lb. per sq. in. For other kinds of wood, the safe unit stress may be found by using Table III, which gives the strength of various kinds of wood compared with white oak. The safe unit stress for green timber is approximately 65 per cent. of that of seasoned timber.

For sake of illustration, let it be required to design the beam for an oak set which must support a maximum weight of 12,500 lb., length of span to be 8 ft.

$$d = \sqrt[3]{\frac{lW}{0.065S}} = \sqrt[3]{\frac{8 \times 12,500}{0.065 \times 1200}} = 10.86, \text{ say } 11 \text{ in.}$$

For round timber posts, the rule in mine timbering is to make the minimum diameter of the post, in inches, equal to its length in feet. For example, in order that a 6-ft. post shall present equal resistance to bending and crushing, the diameter of its small end must be 6 inches.

For squared timber collars, the formula is

$$W = \frac{bd^2S}{9l}$$

in which

W = Safe load on the collar in pounds;

b = Width of collar in inches;

d = Depth of collar in inches;

l = Length of collar between supports in feet;

S = Safe unit stress in pounds per square inch.

The values of W , S and l are known and, by assuming

the width, the value of d is easily calculated; or, by assuming the depth, the value of b may be calculated. Other conditions being equal, the depth of the beam should be greater than the width for practical economical sections.

To illustrate, let it be required to design a rectangular oak beam to support 3 ft. of loose slate in a 12-ft. entry, assuming the timber sets to be 4-ft. centers and taking the weight of the slate as 160 lb. per cu.ft.

$$\text{Weight} = 3 \times 12 \times 4 \times 160 = 23,000 \text{ lb.};$$

$$S = 1200 \text{ lb.};$$

$$l = \text{say } 10 \text{ ft.};$$

Assume $b = 8 \text{ in.};$

$$d = 3 \sqrt[3]{\frac{Wl}{bS}} = 3 \sqrt[3]{\frac{23,000 \times 10}{8 \times 1200}} = 14.68, \text{ say } 15 \text{ in.}$$

TABLE III. COMPARATIVE STRENGTH OF VARIOUS KINDS OF WOODS

Kind of Timber	Comparative Strength When Used as a Beam; the Strength of White Oak Being Taken as Unity	Comparative Strength When Used as a Post; White Oak Being Taken as Unity
White oak.....	1.00	1.00
Red oak, No. 1.....	0.95	1.00
Red oak, No. 2.....	0.90	0.90
Hickory.....	1.00	1.00
Longleaf pine.....	1.00	0.90
Shortleaf pine.....	0.75	0.90
Norway pine.....	0.65	0.80
White pine.....	0.60	0.70
Spruce.....	0.75	0.80
Cypress.....	0.50	0.80
Hemlock.....	0.50	0.80
Chestnut.....	0.70	0.80
Cedar.....	0.60	0.70
Douglas fir.....	0.65	0.90

TABLE IV. SAFE LOADS FOR SQUARE TIMBER BEAMS

Length of Span, Feet	Safe Loads in Pounds for Oak Beams with Uniformly Distributed Loads									
	6x6	7x7	8x8	9x9	10x10	12x12	14x14	16x16	18x18	20x20
6	4,800									
7	4,110	6,530								
8	3,600	5,720	8,530							
9	3,190	5,080	7,590	10,800						
10	2,880	4,570	6,830	9,720	13,330					
11	2,610	4,150	6,210	8,830	12,120					
12	2,400	3,800	5,690	8,100	11,110	19,200				
13		3,520	5,250	7,480	10,260	17,720				
14		3,270	4,880	6,940	9,520	16,460	26,130			
15		3,050	4,550	6,480	8,890	15,360	24,390			
16			4,270	6,070	8,330	14,400	22,870	34,130		
17			4,020	5,710	7,840	13,550	21,520	32,130		
18			3,790	5,400	7,410	12,800	20,330	30,340	43,200	
20					6,670	11,520	18,290	27,310	38,880	53,330
22						10,470	16,630	24,820	35,350	48,480
24							9,600	15,240	22,760	32,400
25								14,640	21,850	31,100

NOTE.—The loads given in heavy figures are the safe loads based upon the extreme shearing stress of 100 lb. per sq.in.; and should not be exceeded for shorter spans, to avoid failure of the beam by shearing. Safe loads are for seasoned timber; for green timber use two-thirds of the value shown. For loads concentrated in the center of the span, use one-half the safe uniformly distributed load. Safe loads for rectangular beams may be obtained from the table for square beams, by direct proportion of width to width. The load for a 10 x 12-in. rectangular beam is five-sixths that of a 12 x 12-in., etc. Safe loads for timber beams of other species than oak may be obtained by direct proportion. The weight supported by each species is directly proportional to the allowable unit stress. For a comparison of the strength of various kinds of timber based on the allowable unit stresses, see Table III.

PRESERVATION OF TIMBER SETS

In most localities woods suitable for use as mine timbers are becoming more scarce and costly. Substitutes must be found, or the wood available must be treated to prolong its life. The cause of mine-timber decay is generally an invisible fungus growth, which establishes itself on the timber and rapidly develops in the cool, damp atmosphere. Fully one-half of all mine timbers fail through decay before failing mechanically.

There are two kinds of decay—dry rot and wet rot. Dry rot is the decay caused by a fungus growth attacking the timber internally with little outward sign of deterioration. Wet rot is decay commonly caused by alternate wetting and drying, and attacks the sap wood or outside of the timber first. Timber kept permanently wet will last many years because the air bearing the fungus growth cannot obtain an entrance into the pores of the wood. Peeling and seasoning will arrest the rapidly growing fungi, but a preservative should be used to effectively increase the life of the wood.

The advantages of the use of preservatives are: (1) Treated timber will have a longer life than untreated and, under ordinary circumstances, will prove more economical; (2) the dangers of falls of rock are lessened because of fewer renewals.

The disadvantages of the use of preservatives are: (1) The first cost is great; (2) since the timber must be seasoned before treatment capital is tied up; (3) the strength of timber is decreased by preservatives; (4) preservative treatment is expensive, unless a plant is specially equipped and is operated extensively; (5) coal tars used as preservatives may add to the inflammability of the wood.

In the various methods of treatment all wood must be

causes the preservative to penetrate deeper into the heartwood. As this form of treatment requires a large and expensive plant to operate economically, it is hardly suitable for the treatment of small quantities, which are necessary for most coal mines.

The preservatives used are: (1) Coal tars and creosotes, these being the most common and in many ways the most efficient preservatives; (2) metallic salts, such as zinc chloride, copper sulphate and mercuric chloride, these being excellent preservatives but easily leached out by water; (3) coal-tar derivatives, such as phenol, which is mixed with metallic ammoniates in the Aczol process; and carbolineum, which is a mixture of zinc chloride and a certain coal distillate.

Creosote and zinc chloride have proved most satisfactory in actual tests, and are used most extensively in the absorption and penetration processes, while carbolineum is more generally used in brush treatment.

TABLE V. COMPARISON OF ZINC CHLORIDE WITH COAL-TAR CREOSOTE FOR MINE TIMBERS

Factor	Zinc Chloride	Creosote
Inflammability....	Less than untreated timber...	More inflammable at first, less later
Corrosion of spikes	Will corrode spikes.....	Not corrosive
Volatility.....	Nonvolatile.....	Volatile—affects mine air
Leachability.....	Leaches; do not use in damp places	Does not leach
Life of timber.....	About 21½ times untreated...	About 3½ times untreated
Cost of treatment.	Less than creosote.....	Approximately twice that of zinc chloride

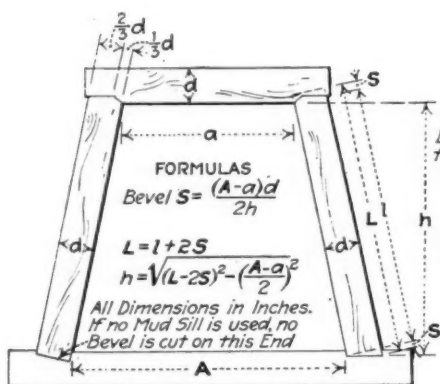


FIG. 7 DETAIL OF A FRAMED TIMBER SET

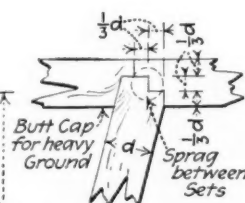


FIG. 8 Detail of Joint for a Framed Set in Heavy Ground

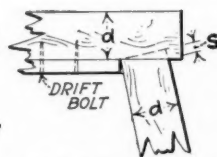


FIG. 9 Detail of Joint for a Common Framed Set



FIG. 11 Example of Framing which has failed under Weight (Point of Leg should have a Bevel Cut)



FIG. 10 WELSH TIMBERING

properly seasoned, or the treatment will not be effective, as the preservative will not be able to penetrate into the pores of the wood, to remain as a permanent preservative. The three common methods of treatment are painting, absorption and penetration.

Painting consists in the simple application of the preservative with a brush, or, in cases, by dipping the timber momentarily in a preservative solution.

The absorption process consists in placing the timber in a tank of preservative, either hot or cold, and allowing the liquid to penetrate into the crevices and pores of the wood. In order to make the treatment more effective, the liquid should be heated to a temperature of about 212 deg. F. The heat will drive off the air and some water from the wood and allow a deeper penetration. After the timber has remained in the hot liquid for some time, it should be taken out and placed in a tank of cool liquid, or be allowed to cool off in the original tank.

The penetration process is used in applying the same chemicals, as in the absorption process; but the application is made under pressure which, with the aid of heat,

The cost of placing wood sets varies with the following conditions: (1) Cost of the timber on the ground; (2) methods of placing, depending on conditions such as hitches to be cut into the roof or rib, the amount of gob to be moved and the character of the roof overhead; (3) size of the timber. With larger sizes, a gang of men will be required, instead of two men usually working together; (4) amount of lagging used.

If the timber gang is to work efficiently, all materials and necessary tools should be delivered promptly when needed. A superintendent should always be close at hand to direct the erection of each set. Whenever a gang is employed underground, some individual is willing to shift his particular part; intelligent supervision is the only cure for this evil, so common to mine work.

TABLE VI. ACTUAL COSTS OF PLACING TIMBER SETS

Size of Collar	Size of Legs	Approx. Weight, Pounds	Cost f. o. b. Mines	Cost in Place
24-in. yellow pine.....	24 in.....	5,040		\$15.00
18 to 22-in. pine.....	18 to 22 in.....	4,150	\$12.00	34.50
12 x 12-in. pine creosoted.....	12 x 12 in.....	1,575	10.56	15.70
12 x 12-in. x 10-ft. oak.....	12 x 12-in. x 7 ft.	1,340	7.92	13.06
10 x 10-in. oak.....	10 x 10-in.....	1,240	7.90	12.30
12-in. by 17-ft. oak.....	No legs.....		3.20	8.86
8-in. by 12-ft. oak.....	8-in. by 6-ft.....		1.60	3.35
8-in. by 18-ft. oak.....	8-in. by 6-ft.....		2.90	6.09

TABLE VII. SHOWING THE COMPARATIVE SIZE OF WOOD AND STEEL CROSS-BARS OF EQUAL STRENGTH: ALSO OF REINFORCED-CONCRETE BEAMS IN PRACTICAL SIZES 10-FT. SPAN

Diameter of Round Oak Timbers, Inches	Safe Load Round Oak Timbers, Pounds	Dimensions of Sawed Oak Timbers, Inches	Size of Steel I-Beam Depth in Inches	Weight of Steel Beam in Lb. per Ft.	Dimensions of Reinforced-Concrete Beam, Inches
6	1,697	4x6	3	5.5	8x10
7	2,695	4x7	4	7.5	10x10
8	4,022	6x7	5	9.75	10x12
9	5,727	7x8	5	12.25	12x13
10	7,856	8x10	6	14.75	12x14
12	13,575	8x12	8	18.00	12x18
14	21,556	8x14	9	25.00	12x22
15	26,515	10x14	10	25.00	.....
16	32,178	12x14	10	40.00	.....
18	45,816	14x16	12	40.00	.....
20	62,847	14x18	15	42.00	.....

NOTE.—The loads assumed in Table VII are the uniform safe loads for round oak bars; fiber stress 1,200 lb. per sq.in.; safety factor about six. All bars whose dimensions are found on the same horizontal line are approximately of equal strength. For bars of other species of wood, increase the dimensions of the oak bars given in Table IV, by multiplying by the factor found in Table III.

General Specifications for all Mine Timbers—All timber shall be cut when the sap is down, preferably in the months of September to January inclusive. All timber not sawed shall be peeled, unless otherwise specified. Timber must be sound and free from incipient decay. Seasoned timber shall show no signs of decay and shall be free from worm holes.

Specifications for Round or Split Props, Posts and Bars—The following listed kinds of wood will be classed as No. 1: White oak, red oak, black oak, post oak, ash, hickory, locust, longleaf yellow pine, shortleaf yellow pine, douglas fir, hard maple, elm and woods of equal strength. All soft woods, such as white pine, cedar, spruce, cypress and gum, shall be classed as No. 2. No timber shall have a diameter of less than 4 in. If the minimum diameter is specified, and the timber is tapering, the diameter of the small end may be $\frac{1}{2}$ in. less, if the diameter of the large end is proportionately larger. If the stick of timber is made by splitting from a larger section, no diameter or sectional dimension shall be less than the specified minimum. The lengths of posts shall not vary more than 1 in. No timber will be accepted if a line projected from the center of one end of the stick to the center of the other end does not fall entirely within the stick.

Specifications for Sawed Props, Posts and Cross-Bars—The grading for sawed timber will be the same as for round timbers. All timbers must be sawed to the size specified, with no variation of more than $\frac{3}{8}$ in. All timber shall be sound, free from decay and show no knots larger than 4 in. in diameter, in the center of any stick; and no knot greater than 2 in. in diameter.

(To be concluded)

Compensation Paid Pennsylvania Mine Workers During 1916

Tabulations of the accidents causing death and disability to workers in and about the anthracite and bituminous coal mines of Pennsylvania, for the year 1916, have been compiled from workmen's compensation agreements filed in the Bureau of Workmen's Compensation and from accident reports submitted to the Bureau of Statistics.

Fatalities and serious accidents in which compensation agreements have been filed, or where the cases were not compensable under the law, are not included in the tabulations. The tables do, however, include compensable cases for fatalities in which it was necessary for the employers to pay only funeral expenses.

These compensation tables indicate that there were 792 fatalities in the anthracite and bituminous coal fields during 1916, while all accident reports received by the Bureau of Information indicate that 1112 workers were killed in and about mines during the same year. The difference in two totals represents open cases and cases not compensable under the law, or cases otherwise classified for compensation in the Workmen's Compensation Bureau.

Anthracite Field—Compensable Accidents in 1916—There were 491 workers killed in the anthracite field for whom workmen's compensation was awarded during 1916, and 9413 workers injured and disabled for periods exceeding 14 days and paid compensation. The average medical cost per accident was \$20.14. The amount of compensation paid and awarded during 1916 for fatality cases amounted to \$1,260,804.

The amount of compensation paid for disability cases during the year 1916 was \$410,845, and it has been estimated that the amount required to carry these 1916 disability claims to completion would be \$56,602. The total amount of compensation paid and awarded in the anthracite field during 1916, and estimated to complete disability claims, was \$1,728,251. The estimated medical cost for all compensation accidents in the anthracite field, during 1916, was \$199,468. The total number of dependents of workers killed and injured in and about anthracite mines during 1916 was 5409.

Bituminous Field—Compensable Accidents in 1916—There were 301 workers killed in the bituminous field, for whom workmen's compensation was awarded during 1916, and 10,710 workers injured and disabled for periods exceeding 14 days and paid compensation. Two women employees were injured in the bituminous field and disabled for periods exceeding 14 days. They were paid compensation. The average medical cost per accident was \$18.92. The amount of compensation paid and awarded during 1916 for fatality cases amounted to \$771,748.

The amount of compensation paid for disability cases during the year 1916 was \$516,493, and it has been estimated that the amount required to carry these 1916 disability claims to completion would be \$37,795. The total amount of compensation paid and awarded in the bituminous field during 1916, and estimated to complete disability claims, was \$1,326,036. The estimated medical cost for all compensation accidents in and about bituminous mines during 1916 was \$208,329. The total number of dependents of miners killed and injured in the bituminous field during 1916 was 10,179.

Anthracite Field—Noncompensable Accidents in 1916—There were 16,979 workers in and about the hard-coal fields injured during the year 1916 and disabled for periods less than 14 days. One of these injured workers was a woman. The total number of days lost by workers disabled for periods less than 14 days amounts to 96,711. The wages lost by workers disabled for periods less than 14 days amounted to \$227,629. The average medical cost for each accident was \$5.52. The average number of days lost per accident was 5. The average wage loss per accident was \$13. The total estimated cost was \$93,727.

Bituminous Field—Noncompensable Accidents in 1916—There were 17,510 workers in and about bituminous mines injured during the year 1916 and disabled for periods less than 14 days. One of these injured workers was a woman. The total number of days lost by workers disabled for periods less than 14 days amounted to 110,710. The wages lost by workers disabled for periods less than 14 days amounted to \$299,951. The average medical cost for each accident was \$5.03. The average number of days lost per accident was 6. The average loss per accident was \$17. The total estimated medical cost was \$88,072.

A NOTED SPEAKER has said "Books are better than gold." Take the hint and read your trade paper. The subscription price is a bagatelle compared with the benefits you will derive from it.

Anthracite Coal Stripping—IV

By THOMAS F. KENNEDY

Seranton, Penn.

SYNOPSIS—This article deals with the calculation of the quantities of overburden and coal. Three methods are in use for determining these quantities. The first and most common gives fairly close results; the second is rapid and forms a good check upon the first; the third involves extra work but gives a closer approximation to actual quantities than either of the others.

AFTER the economic stripping limit has been staked out upon the surface and the necessary elevations have been taken, preliminary estimates of quantities of overburden and coal are next determined, in order to furnish to the contractors information for bidding. In making the estimates of quantities in place, the engineer cannot furnish minutely accurate figures, but only an approximation. In other words there is no absolutely correct method of calculating the volume of overburden or tonnage in a stripping problem.

All formulas used in estimating volumes assume the solid to be bounded by planes, while the actual bounding surfaces are irregular, curved and undulating. This is true of a bed of coal which rolls and generally has not only irregular and undulating top and bottom bounding surfaces, but also an overburden which likewise possesses similar characteristics. In determining the amounts of the various classified materials, the accuracy of the estimates depends upon the thoroughness of the prospecting, the number of proving holes, the ability of the driller in judging the thicknesses of the various strata (when a churn drill is used), recording the results, and finally the method of calculation.

METHODS OF ESTIMATING OVERBURDEN

To estimate the quantities of overburden and coal in a stripping problem there are several good methods in practical use. The most common of these are the average end area (vertical method), and the average thickness and contour sections (horizontal method), which will be described in detail. The explanation of the methods that follow applies only to preliminary estimates of quantities in place, while the final estimate operation will be described later.

The average end method, which is used by many estimators in calculating volumes in excavations, cuts and fills, dumps, etc., is the most common method of determining the quantity of overburden in stripping work. In order to explain clearly the application of the average end method of determining the volume of overburden, a typical problem in stripping will be assumed. Referring to Fig. 1, a plan and several cross-sections of a proposed stripping are used in the quantity calculations. By studying the plan and cross-sections, it will be seen that the following data must be obtained in the field—namely, all topographic features, the proper location of each borehole, the surface elevations of each borehole and breaks, borehole sections and all other information that might be used in determining the stripping limits.

The surface elevation and section are written alongside of each borehole. In the explanation of this method of calculation only a limited number of boreholes, with their surface elevations and sections, are shown upon the plan. Several elevations on the bottom of the coal bed in the faces of the chambers abutting the proposed stripping area are shown.

After a thorough study of the problem, the overburden limit is determined and delineated upon the

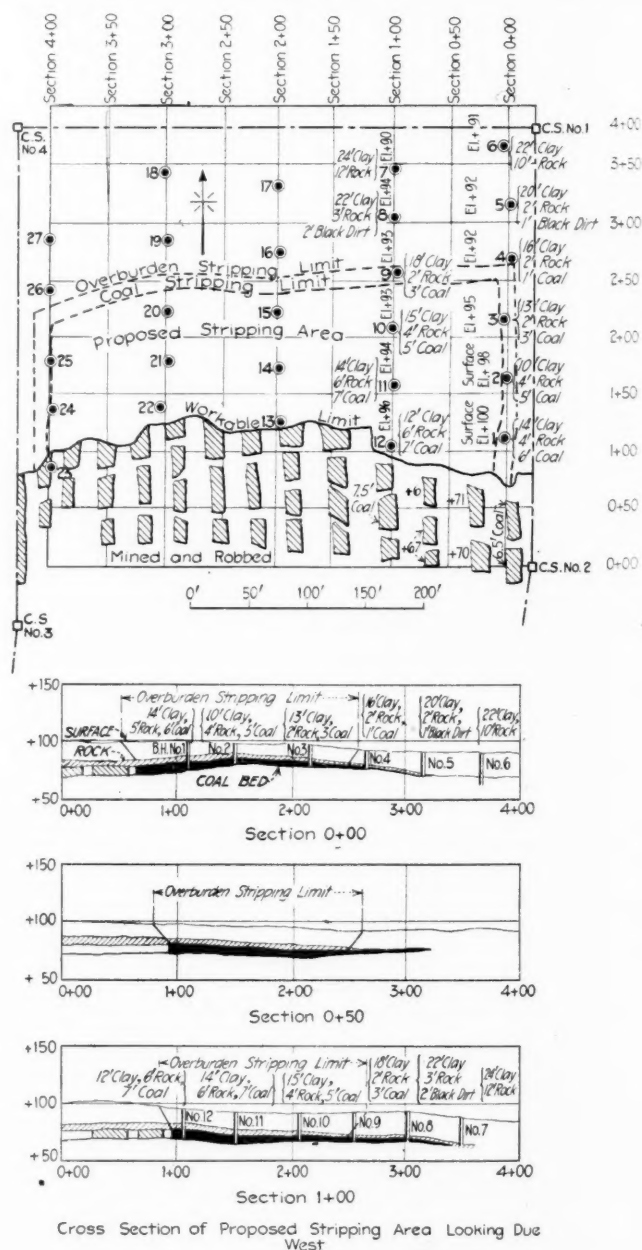


FIG. 1. AVERAGE END METHOD OF CALCULATING OVERBURDEN

plan, as described by the writer in *Coal Age*, issue of Jan. 5, 1918. The calculation of the overburden is then considered.

The scale of the plan should be either 1 in. = 25 ft. or 1 in. = 50 ft., depending upon the size of the strip-

ping area, a small area requiring a large scale while in a large proposition the smaller scale may be used. The large scale produces closer results. As will be noted, the scale of the accompanying plan and cross-sections is 1 in. = 100 ft., used only for descriptive purposes.

The longest dimension of the stripping area is seen to be east and west. The cross-sectioning of the area at

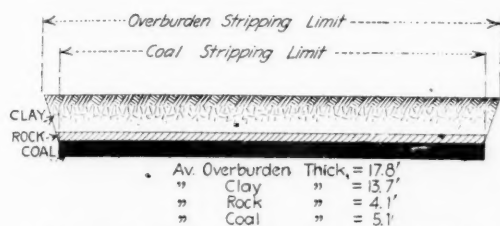


FIG. 2. AVERAGE THICKNESS METHOD OF CALCULATING QUANTITIES OF OVERBURDEN AND COAL

right angles to the longest dimension is most desirable, because more sections can be obtained for calculation purposes, incidentally producing the most probable volume value and reducing the probable error to a minimum. The choosing of the cross-section interval depends upon the variation in thickness of the overburden, which information is furnished by the borehole sections.

If the thickness is uniform throughout the proposed area, a cross-section interval of 50 ft. is good enough for close calculation purposes; but when the sections show a varying thickness, a distance of 25 ft. should be used. The cross-sections as constructed are drawn to a scale of 1 in. = 10 ft. vertical and horizontal in the usual manner by using the surface elevations of the boreholes and breaks and borehole sections. Cross-sections 0 + 00 and 1 + 00 are plotted from the borehole information, and section 0 + 50 is plotted by interpolation of sections 0 + 00 and 1 + 00. The overburden stripping limit and slope line are drawn upon the section which shows the area of overburden to be excavated and the portion of the coal bed to be stripped.

DETERMINING VOLUMES OF CLAY AND ROCK

The volume of overburden between sections 0 + 00 and 0 + 50 is then determined by multiplying the average of the overburden areas of the two sections by the interval distance, 50 ft. in this case. When the material to be excavated is classified, the volumes of clay and rock are obtained by running the areas of the clay and rock separately, and applying the percentage ratio to the total volume of overburden. The area may be obtained by dividing the overburden into triangles, trapezoids, etc., or by using a planimeter, which is good enough for close results. When the planimeter is employed three readings at least should be taken and the mean average used. The volumes between 0 + 50 and 1 + 00 are found in the same manner and the total quantity is the summation of the sectional volumes. In stripping contracts classification of overburden is noted, so that the number of cubic yards of clay and of rock should always be calculated.

The most practical way of estimating the tonnage of a stripping is the foot-acre method. The tonnage in any coal bed depends upon the area of the bed, the coal thickness and the specific gravity of the coal. The specific gravity can be calculated by procuring various

representative samples of the coal from the drillings and weighing the combined amount in the air on a delicate scale and then weighing it immersed in water, noting the loss in the weight of the coal. The specific gravity is then found by dividing the weight of the coal in the air by the loss of weight of the coal in the water. The specific gravity of anthracite coal will vary from 1.3 to 1.8, the average being about 1.5. The total number of long tons in place is found from the following formula:

$$X = \frac{(43,560)(sp.gr.)(62.5)(T)(N)}{2240}$$

in which

- X = Number of long tons of coal in place;
- 43,560 = Number of square feet in one acre;
- $Sp.gr.$ = Specific gravity of coal;
- 62.5 = Weight of 1 cu.ft. of water in pounds;
- T = Average thickness of coal bed in feet;
- N = Number of acres of coal to be stripped;
- 2240 = Weight of 1 long ton in pounds.

In making the estimate of merchantable or marketable tons of coal, the following important factors should be considered—namely, coal impurities, fuel and breaker losses, dockage and other allowances, characteristic of each individual stripping. In a virgin coal stripping 80 per cent. marketable seems to be an average figure, while in a mined-out territory it will drop as low as 50 per cent.

The second way of determining the volume of overburden is the average thickness method. The total volume of the overburden is found by multiplying the mean

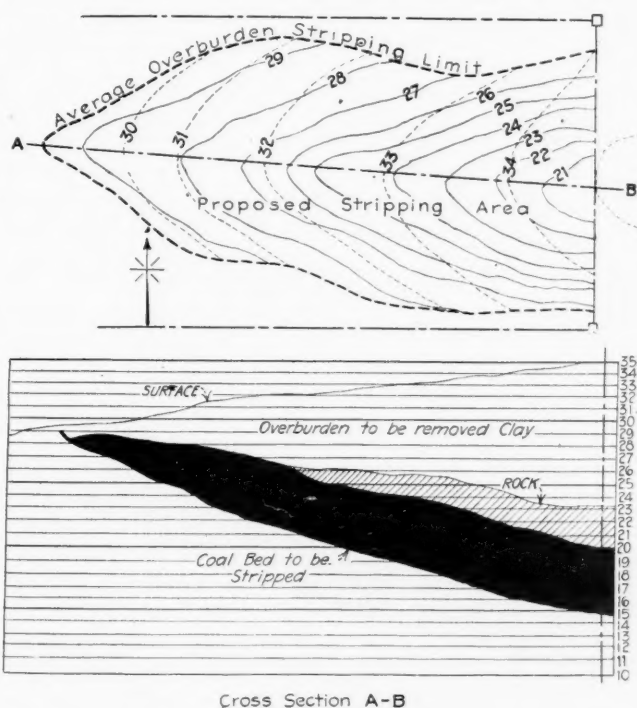


FIG. 3. CONTOUR METHOD OF CALCULATING OVERBURDEN

area of the areas included in the overburden and coal stripping limits by the average thickness of the overburden, as obtained from borehole sections. Referring to Fig. 2, the average overburden thickness is 17.8 ft., the average thickness of clay 13.7 ft., and the average thickness of rock 4.1 ft., so that the number of yards of

classified material can be obtained from the above percentages.

In discussing the third way, or contour method of overburden calculations, a problem is shown in Fig. 3. From the borehole data and other information the internal contours of the coal bed are shown in full lines, while the external surface contours are drawn in broken lines. The contours are delineated every foot for close calculation. The overburden stripping limit shown is the average limit of the overburden and coal stripping limits. It will be assumed further that the area to be stripped extends to the west property line.

The volume of the overburden is estimated in the following manner: The volume between contours 20 and 21 (see cross-section AB) is obtained by multiplying the mean area of the areas included by contours 21 and 20 and the west property line, by the contour interval, 1 ft. in this case. The volume between contours 21 and 22 is obtained in the same manner. The total volume is the summation of the horizontal sectional volumes. The amounts of clay and rock are obtained as described in the second method above. This method is the horizontal slicing of the overburden through the contours, while in the first method the average end areas constitute the vertical slicing at certain cross-sectional interval distances.

In conclusion it might be said that the first method, the most common one in use, should be taken advantage of because the cross-sections must be plotted for other general information and the results are fairly close. The second method is quick and serves as a check upon the first, while the third entails extra work in drawing contours but furnishes the closest estimate of volume. All three methods produce the required practical results.

(To be continued)

Legal Department

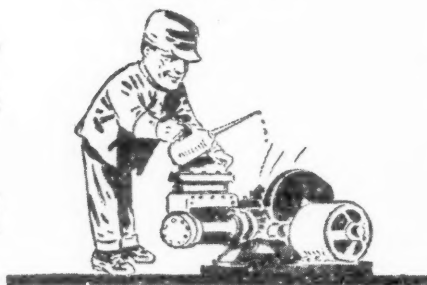
CHATTEL MORTGAGES—TERMINATION OF LEASES—A coal company could give a valid mortgage covering book accounts and personal property to be acquired in the future, as well as existing property. The right of a lessor of premises used as a coal yard to forfeit the lease because of the lessee's default in paying taxes as agreed was waived where no attempt to declare a forfeiture was made until eight or nine months after the default occurred. And a rendering of statement for rent and acceptance of payment thereof waives any right to forfeit the lease arising before the rent accrued. (New Jersey Court of Chancery, Commercial Trust Co. vs. L. Wertheim Coal and Coke Co., 102 Atlantic Reporter, 448.)

RIGHTS UNDER WATER-TRANSPORTATION CONTRACT—Where a Great Lakes transportation company contracted with a coal-mining company to employ certain of its steamers on all their west-bound trips in carrying the coal company's product, for three seasons, and, by reason of several years' previous practice under such arrangement the coal company's business had been so built up that water transportation was essential to its profitable operation, and it appears that other vessels would not be available as substitutes, the law raises an implied obligation on the part of the transportation company to continue operation of the boats during the life of the contract, and the coal company is entitled to restrain the transportation company from disposing of its boats in such manner that the contract would be broken and such company would not be financially responsible for the damages sustained by the coal company in consequence of breach of the agreement. The contract having been made with full knowledge of war conditions in Europe, the courts will not deny the coal company relief because a sale of the vessels might be highly advantageous to the transportation company. (United States Circuit Court of Appeals, Seventh Circuit; Great Lakes & St. Lawrence Transportation Co. vs. Scranton Coal Co., 239 Federal Reporter, 603.)

THE WAIL OF THE PUMP

By RUFUS T. STROHM

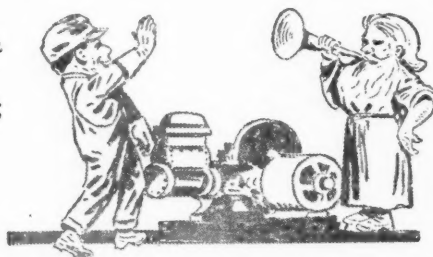
I'VE got no pull, an' I'm out of luck,
An' I don't know a friendly soul
To take my part, which is why I'm stuck
Way down in this blasted hole;
An' here I sit in the blightin' dark
An' clatter an' clank an' clump;
But take my word that it ain't no lark—
This bein' a common pump.



With now and then a squirt of oil

I DO my angels-could-do-no-more,
An' I do it night an' day,
A-helpin' the chaps that drill an' bore
In makin' the bizness pay.
I'm a homely duffer, but goodness knows
That I'm always on the jump;
Still, no one pays any heed, I s'pose,
Because I'm a common pump.

THE life that the hoistin' engines lead
Is a cinch compared to mine;
They're rubbed an' groomed like a
racin' steed
Till their brass an' brightwork shine;
But all I git is a chanst to toil
In the dirty, inky sump,
With now an' then just a squirt of oil,
For I'm but a common pump.



Getting word of praise before Gabriel blows his trumpet

I'TS true my looks is agin me, bo,
For my coat is grime an' rust,
But here's a thing that you may not
know—
I've a heart inside my crust;
An' before ol' Gabriel ups an' plays
That blast on his brazen trump,
I'd like to hear just a word of praise
Let fall for the common pump.

Mining Engineers Consider Industrial Relations

BY R. DAWSON HALL
Associate Editor, "Coal Age"

SYNOPSIS—*The American Institute of Mining Engineers devotes a session to coal, a session to nonferrous metallurgy, one to mining and milling, one to iron and steel, one to petroleum, and two, the most animated of all, to employment problems.*

THE new era in which we find ourselves was well marked at the recent meeting of the American Institute of Mining Engineers. It is an era of social questions. One wonders what the founders of the institute would have thought if out of nine sessions seven had reference to seven different phases of mining while two related to the human factor in the industry.

Our predecessors would be surprised to find that engineers brought up to regard the material side of their profession as all absorbing now allowed the immaterial side of their industrial activities to take paramount place in their consideration. The institute is being changed rapidly by forces from without. We are no longer able to overlook the problem of the human factor in mining.

Some people take no small satisfaction from the fact that we are rising to a better conception of human relations. Unfortunately, it seems more likely that our welfare work is but a poor substitute for the mutual understanding of earlier years. The laboring classes are becoming a segregate class of men with different ideals, psychology, reactions and purposes to the employing class. So long as this exists there is need for industrial diplomacy.

NEED FOR GREATER GENERAL CULTURAL EQUALITY

The only complete cure is to so educate the workingman that he will have similar ideals, psychology, reactions and purposes. This alone will make the ambassadors unnecessary. Two men cannot associate unless they have similar viewpoints, and the only satisfactory solution is one which succeeds in implanting in both classes the highest type of ideals. There will certainly be no true democracy till the employer and employee, when thrown together, can discuss their common interests with mutual comprehension.

It seems that in this unification and ultimate unity lies success, and not in any skilled pourparlers between segregated classes. As the workingman becomes relatively less literate and less cultured than his employer, the employer and the employer's family will necessarily segregate themselves more completely from the workingman. Decreased literacy and decreased culture is sure to follow such a separation, and the segregation will gradually become more and more complete till the conditions in Europe, and especially in Central Europe, will follow. There the respective classes talk almost different dialects.

We need above all things a cultural equality without which the people of the nation cannot possibly live a common life. This disposition of persons to separate into cliques arises from their cultural inequality. The uncultured man is as much repelled by the cultured man's life as the cultured man is repelled by the life of the uncultured.

When the institute met at the Engineering Societies Building, 29 West 39th Street, New York City, Feb. 18, for its 116th meeting, it found the Coal Session at the head of the program and Edwin Ludlow, president of the Lehigh Coal and Navigation Co., presiding.

The papers were read by title and then a synopsis was given, usually by the author. The first paper presented was a valuable article on "The Drifton Breaker," by E. P. Humphrey. A most interesting paper by R. E. Hobart, mechanical engineer of the Lehigh Coal and Navigation Co., followed. It was entitled "The Economy of Electricity Over Steam for Power Purposes In and About the Mines." The author compared the cost before and after electrification. With steam the cost of power was 13.7c. per ton, with electricity a trifle under 7c. The charges were practically cut in two.

ELECTRICITY SAVED COSTS AND RAISED OUTPUT

However, it must be remembered that the tonnage was larger after the introduction of electricity, and the larger tonnage had probably some effect on the lower cost of power. But this larger tonnage is, at least in large degree, creditable to electrical operation. In this connection the author of the paper said: "As the use of electricity permitted more efficient work and less loss of time from repairs, drownouts, etc., the coal hoisted increased from 343,665 to 435,073 tons per year." The saving, figuring on a basis of 435,073 tons per year at the cost per ton for steam and electric power respectively, figured at \$29,149 per annum.

In an animated discussion it was pointed out that the electric current costs at the colliery had no item as large as that credited to the running of the air compressor. The electrical advocates suggested that a plant where nearly 40 per cent. of the electric current went to the running of an air compressor could not be regarded as a real electrical plant. They hinted that a more complete electrification might well have shown even better results as the losses on the compressed-air lines were much greater than those on electric current.

On the other hand it should be observed that the lift demanded of the steam hoist was 581 ft. and of the electric hoist 266 ft., not one-half as much. Hoisting, however, did not constitute a large percentage of the burden. In the electrical plant it cost only 15 per cent. as much as the whole load. What it cost with the steam plant is not revealed. It may have been much more.

Objection was taken to the fact that no equipment prices were given. The author declared, however, that

new equipment had to be bought when the site of the shaft was changed, and the question of what net profit could be obtained by replacing old equipment with new did not arise. A change of some sort was necessary. In the course of the discussion Eli T. Conner testified to the economy effected by the introduction of electricity in a plant under his charge.

W. P. Frey's paper on the "Briquetting of Anthracite Coal" was also one furnished from the experience of the Lehigh Coal and Navigation Co., which under broad-minded management is giving the coal industry the full benefit of its experience. W. P. Frey is fuel engineer of the company. The paper stated that as a result of replacing the coal-tar pitch binder by hydrolene, or "asphaltum" as the Standard Oil Co. prefers to term it, the company has been able to turn a losing venture into a winning one. Still the cost of the briquetting is quite large, silt at \$1 a ton making briquets costing \$3.35 after every item of expense is charged.

USE OF LARGE AND SMALL PERCENTAGE BINDERS

The "Dutch-oil process," as it is called, has the advantage that it livens the combustion of the more completely carbonized anthracite, when that material is briquetted. The cornstarch-asphaltum binder, described by Burke Baker in his discussion, can have that effect only in moderate degree, but then many anthracites do not need it and none of the bituminous coals require any help from added bituminous matter.

The Dutch-oil process improves the heating qualities of the anthracite. A binder with less oil does not improve the fuel in an equal degree, but again some fuels do not need that improvement—they have a coal content with more available hydrogen and they have a lower ash percentage. At this present time it is not well to make a selection without a full knowledge, seeing that both binders have such excellent points.

It was said in the discussion that where 7 to 10 per cent. of losses were sustained in the handling of anthracite at the yards the degradation of briquets was less than 1 per cent. It was also stated that by the Dutch-oil process briquets could readily be made with 5 per cent. of hydrolene instead of 7 per cent., but as a result they would be less easily consumed.

The objection to the original coal-tar process was said to be the necessity for complete dehydration of the coal, but with the masticator used in the Dutch-oil process 2 or 3 per cent. of moisture in coal does no harm as saponification takes place with advantage.

"Heating of Coal in Piles," by C. M. Young, was neither read, briefed nor discussed, as Mr. Young was not present as promised. G. S. Rice gave an illustrated address in place of an abstract of his "Review of the Coal Situation of the World." He showed maps and photographs of scenes illustrating the foreign coal fields. A map of France showed the distribution of coal before the war in the various French *départements*.

It was evident that the French coal was used in the *départements* near where it was mined. British coal was largely used near the ports and German coal near the frontier. This map brought A. H. Storrs to his feet. He said it evidenced the fact that even before the war there was a minimum of cross-hauling in France, and

he urged that in America, at least during the war, an attempt be made by careful zoning to prevent unnecessary cross-hauling.

The article by C. F. Wang on the "Pen-Hsi-Hu Coal and Iron Co., South Manchuria," was discussed, but not at great length. It shows clearly how the introduction of machinery is no solution of difficulties unless it is accomplished by skillful and sympathetic management. As one man put it: It does not do to put Occidental machinery in Oriental hands and expect that it will do all that it is doing in the Occident. It is necessary to provide Occidental management if the machinery of the West is to do what is planned for it. The East has its guilds and its ways. "East is East and West is West."

Mr. Wang tells us in his paper without comment or hysteria, "There are about 1500 miners in the coal mine alone." Probably this includes all the mine workers. Just below he says, "The daily output for 1917 is about 1200 tons," which is an output of 1200 long tons from 1500 men working in No. 1 pit in 15 ft. of coal, in No. 2 pit in 12 ft. of coal, and in No. 3 pit in 7 ft. of coal. Of course, the coal pitches heavily, about 20 deg., and has some heavy partings, especially the thicker coal. But even granting these drawbacks the tonnage is distressingly low.

Then again, Mr. Wang without comment tells us that the No. 1 coal before washing gives 8442 calories and after washing only 8200 calories, that before washing the sulphur content is 0.709 per cent. and after washing 1.16 per cent. The ash is lowered, however, by washing, from 11.30 per cent. to 8.56 per cent.; the fixed carbon is increased from 70.88 to 79.50 per cent. The volatile matter is lowered from 17.72 to 14.94 per cent. As a result the fuel ratio is changed from 4 to 5.321.

Whoever heard of a coal that changed the nature of its vegetal content in this manner by the mere process of washing? One would think that the process must surely be one of distillation, not of mere gravimetric displacement. Of course, it is possible that by some strange freak of nature the coal in the slate might be more bituminous than that in the clean bed; but if so, how so? It is certainly a mysterious matter.

CHEAP LABOR GETS OUT COAL FOR \$3.76 PER TON

The costs per long ton—for apparently the long ton is meant—are \$3.76. The wage of the men is not given, but it is doubtless extremely small. The miners work 12 hours and are hurried along by that piece system which all authorities, from Tubal Cain to Taylor, are convinced gives the best results. Something is wrong, however, or the cost would not be so high.

We are told to fear these Chinese with their fearfully low rates of pay. We hear every little while the story that we must pay American workingmen less or be swamped by the yellow peril. As a matter of fact, we do not pay our workingmen big wages—they earn big wages. Their large product assures them of it. When Chinese laborers do an American laborer's stint they will earn good wages, for they will get in proportion to their production. Can anyone wonder that men who work as inefficiently as these Chinese are at the ragged edge of poverty? Were it otherwise, economic law would be a fraud and a deceit.

(To be continued)

Ash Influence on Fuel Value of Small Anthracite Coal*

BY FRANK G. PHILO

THE value of coal as fuel depends not alone upon the total number of heat units, or B.t.u. per pound, but upon the fraction of the total heat contained which can be produced under actual conditions of combustion and operation. The B.t.u. value of one coal as represented by a calorimetric determination may be higher than a second actually, but the lower B.t.u. coal often shows a higher actual fuel value. This can be seen when it is considered that the calorimetric determination does not include the moisture in the coal, as fired, the amount and composition of the ash, whether it contains excessive slag or clinker-forming constituents, or there are present such impurities as sulphur compounds, which in spite of their heat-producing properties are often the cause of partial corrosion of the boiler, the breeching and the bunkers.

The sample of coal tested by the calorimeter is usually burned in an atmosphere of pure oxygen, a condition much different from that in practice, where an atmosphere of only 21 per cent. of oxygen exists. It follows that the most practical way to determine the relative fuel value of different coals is to burn a considerable amount of each grade upon the grates and in the furnace under operating conditions and note the characteristics accompanying each grade.

Tables I and II and the charts, Figs. 1 and 2, show the results of tests during which over 20,000 tons of No. 3 buckwheat coal were fired and over 500 chemical analyses were made.

The coal used was fired into the same type of furnace and upon the same "sawdust" grate, having small circular air spaces ranging from $\frac{3}{32}$ to $\frac{1}{8}$ in. in diameter. The area of the air spaces represented about 8 per cent.

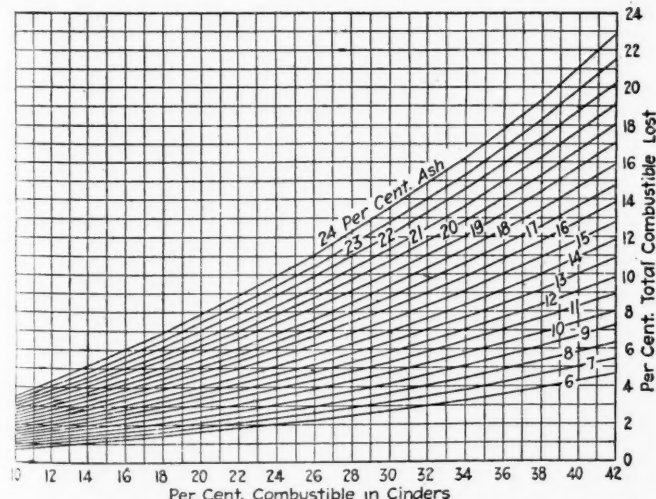


FIG. 1. CURVES WHICH DESIGNATE ASHPIT LOSSES

of the total grate area. Forced draft was used, and an average pressure of 1 in. of water. As practically no coal fell through the small openings, the fuel losses in the ashpits represented these, due to the combustible carried with the ash at cleaning periods, which, in this

plant, occur once every six hours. It was found practically impossible to economically burn out more combustible after it had been burned until it represented about 18 per cent. of the material left on the grates after "pushing back." This fixed ratio of combustible to refuse mainly accounts for the rapid rate in which

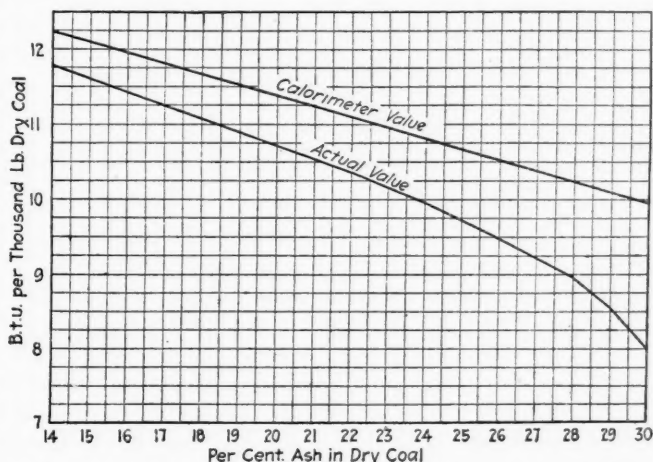


FIG. 2. CURVES SHOWING ACTUAL AND CALORIMETER VALUE OF FUEL

the losses in the ashpits increased with the higher ash coals. The percentage of the total combustible lost was calculated from the following formula:

$$\text{Per cent. total combustible lost} = \frac{(\text{per cent. ash in dry coal}) \times (\text{per cent. comb. in dry refuse})}{(100 - \text{per cent. ash in dry coal}) - (100 - \text{per cent. combustible in dry refuse})}$$

With anthracite as fuel, the value of the combustible in the refuse is almost the same as that of an equal weight in the coal fired, so no correction was applied.

TABLE I. COMPARISON OF THE CALORIMETER VALUE AND ACTUAL VALUE OF DIFFERENT ASH COALS*

Per Cent. Ash in Dry Coal	Calorimeter Value per Lb. Dry Coal B.t.u.	Actual Value per Lb. Dry Coal B.t.u.	Act. Value Cal. Value Per Cent.
14	12,220	11,755	96.2
16	11,920	11,420	95.8
18	11,640	11,080	95.2
20	11,350	10,714	94.4
22	11,080	10,348	93.4
24	10,800	9,936	92.0
26	10,510	9,459	90.0
28	10,240	8,949	87.4
30	9,950	8,000	80.4

* The "actual value" of a pound of coal is here taken to mean the difference between the total B.t.u. contained in 1 lb. of dry coal fired and the B.t.u. in the combustible in the dry refuse per pound of dry coal fired.

To simplify the calculation of ashpit losses the curves in Fig. 1 were plotted, based on the formula given.

TABLE II. CALORIMETER AND ACTUAL VALUES OF DIFFERENT ASH COALS AS COMPARED WITH 14 PER CENT. ASH COAL AS A STANDARD

Per Cent. Ash	Calorimeter Value (Cal. Val. of 14 Per Cent. Ash Coal) Per Cent.	Actual Value (Act. Val. of 14 Per Cent. Ash Coal) Per Cent.
14	100.0	100.0
16	97.5	96.9
18	95.3	94.1
20	92.9	91.0
22	90.7	88.3
24	88.4	84.5
26	86.0	80.5
28	83.8	76.1
30	81.4	68.1

*Reprinted from "Power."

The tables and curves will be found useful in calculating the penalties to be imposed for high ash when coal is to be purchased on specification. Although the actual values given will not apply to all sizes and kinds of coal, the actual-loss curve will be about the same. Of course, in computing the economic value of the different coals, due allowance must be made for the transportation costs, cost of handling the coal and refuse, and the increased depreciation and maintenance charges against the grates and stokers that accompany high ash and clinker. The reduction of the capacity of the boiler and the furnace must also be borne in mind, especially in plants where the boilers are required to operate at high overloads.

Third Liberty Loan Soon To Be Issued

The third Liberty Loan will undoubtedly exceed in amount not only its two predecessors in this country, but any single war loan or other loan ever offered in the history of the world. The program of the Treasury is of course subject to such change as the rapidly changing conditions of the war may warrant.

No loan of such proportions can be successfully absorbed unless the entire nation responds to the offering and unless every citizen prides himself on the practice of self-denial to the end that he may subscribe to the limit of his ability. The number of subscribers to the last loan has been estimated at 10,000,000. Proportionally for the new loan it must exceed 15,000,000, or contain one in six at least of all the men, women and children in the country.

It must be obvious from the foregoing that Americans individually will need to squeeze the dollar they spend on themselves as they have never yet done before. Luxuries and extravagance must go completely out of fashion; should, in fact, be considered little short of treachery. Shabby clothes and old hats must be worn longer, diet be cut to the wholesome essentials, and we must no longer hire others to do for us those things which we can do for ourselves.

As a belligerent this country has already outgrown the "business as usual" stage of thought as well as of practice. There is not enough capital, labor, coal, transportation or raw material to go round if those industries which are not essential to the conduct of war are continued at their normal productiveness. A vast multiplication and expansion of the essential industries is only possible when other unessential industries are bled white of capital, labor and materials to support the increase in the activity of the essential industries. Every unessential industry which continues in operation must be considered as bidding against the nation for its life's blood.

The complexity of the modern industrial organization has helped to confuse the popular mind regarding the function of money. There is a widespread assumption (1) that money is a miracle worker and can make good for the nation as a whole the shortages in labor and materials which it seems to correct in individual cases, and (2) that some virtue attaches to the keeping of money in circulation by promiscuous expenditure.

In England these fallacies have been successfully assailed in connection with the War Savings Movement.

In that country it is termed the "gospel of goods and services," and we may translate it into American as a "gospel of labor and materials."

Labor and materials are the only things that count in support of the fighting machine and they cannot be bought if they don't exist. At any given time there is only just so much of these vital necessities available in the country as a whole for all the many purposes of industry. Every unessential industry which burns coal deprives the essential industries by just so much of the supply available for their purposes. So does every housewife who burns an unnecessary hodful in her kitchen range¹. Every man who buys a new overcoat is bidding against Uncle Sam who is buying overcoats for soldiers. And every dollar spent on a luxury is helping to support an unessential industry in the competitive consumption of essentials. Money spent on Liberty Bonds gets as wide and as immediate circulation as that spent on candy or theater tickets, but it goes to support industries which produce those things which the Government needs.

But if it is true that, in the last analysis, labor and materials are the only things that can be of any value in the support of our fighting machine, it is also true that the only economy of these things which counts is present economy. We cannot increase the present supply of these things with the thought that we might have used more of them than we did a year ago. The only food or clothing or fuel or munitions of interest to our soldiers and sailors is that which is available today. Past savings of these things have all been absorbed.

The war must be waged entirely on present savings. Hence the imperative necessity for thrift, not only on the part of those who have never before put aside anything, but also on the part of those who normally would be spending the income from past savings. The latter especially must be made to feel that in living on such incomes they are simply exchanging their own past savings or those of their ancestors for the present savings of others, in other words, competing with Uncle Sam for these present savings. It is their duty in the present situation not only to practice self-denial in the matter of consumption but if possible to support themselves by some occupation of value to their country and turn over their private incomes to the Government in the form of Liberty Bond investments.

It is every citizen's double duty to produce more and consume less, not only that he may have greater individual savings with which to invest in the Government's securities, but also that he may help to increase the aggregate of labor and materials (the war surplus) which the Government may purchase with the proceeds of these securities.

To inspire the average citizen with zeal for his two-fold effort, to justify to his mind his unaccustomed sacrifices for the common good, it is highly necessary always that his realization of the issues involved in the war be strengthened and that on the one hand he should visualize more perfectly the power, ambition, cruelty and arrogance of the enemy, and on the other the vastness of his country's needs, its tremendous preparations and the heroism and self-sacrifice of its defenders.

¹This is only true when the miners are working steadily and the coal is hauled by an overoccupied transportation agency. A hodful of coal burned on a mine tippie by a company that has cars only three days a week is not taken away from the war and does not injure the nation.—Editor.

NEW APPARATUS AND EQUIPMENT

Securing Better Mine Ventilation

One of the great causes of waste in underground operations has been lack of ventilation. Operators are learning that by supplying better and more air to the men the output is increased, costs are lowered and the general health of the men is improved.

The most successful development in mine ventilation has been found in the use of specially treated canvas

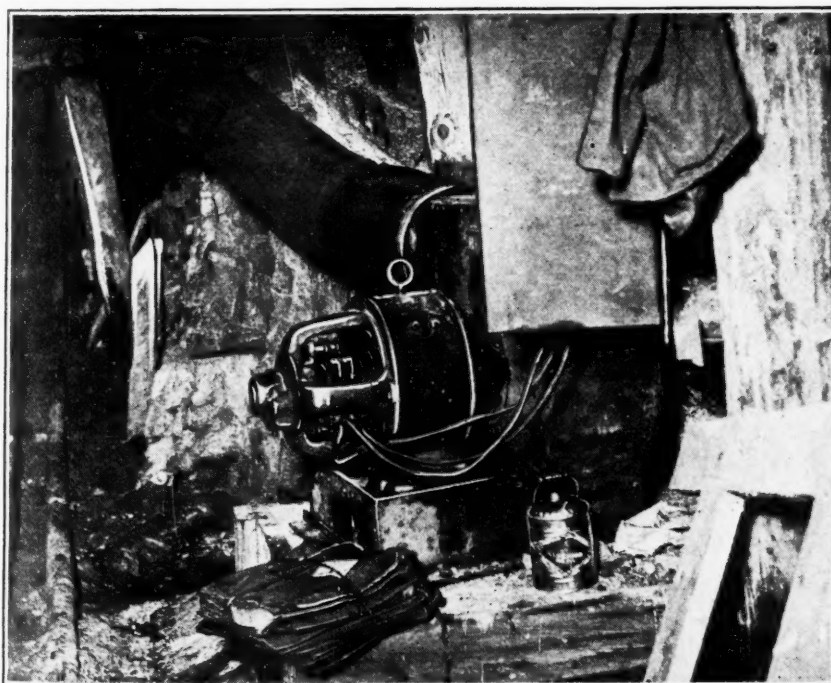
work. The Bemis Brothers Bag Co., of St. Louis, Mo., has recently introduced its Flexoid tubing, and it is used by a number of operators both in the United States and in foreign countries with excellent success. Flexoid tubing is made by saturating a strong canvas with a special preserving compound that protects the fiber from dry rot, acid water and the action of the weather. No tools are required to make the coupling, which con-



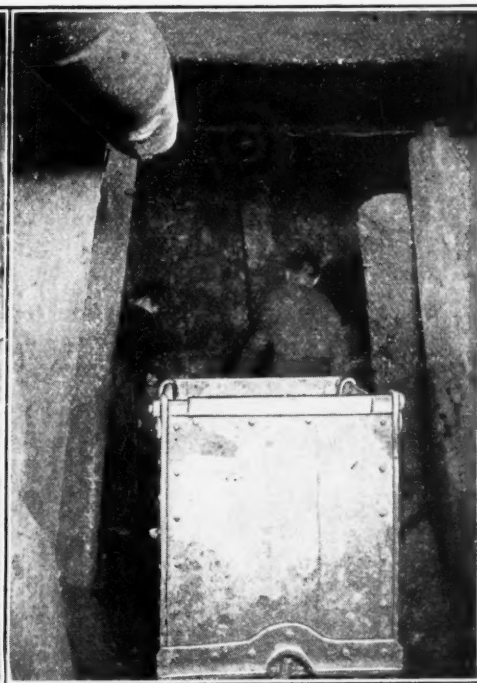
SUSPENDING A 100-FT. SECTION OF FLEXOID TUBING



JOINING TWO SECTIONS OF FLEXOID TUBING



MOTOR, BLOWER FAN AND TUBING INSTALLED UNDERGROUND



DRIFT, 15 MINUTES AFTER BLASTING

tubing, which makes a satisfactory air duct and meets all the necessary requirements. It is light, easily and quickly installed, combines toughness with flexibility, and satisfactorily stands the severe conditions of mine

sists of two contracting rings with flanges sewed in each end of the tubing. The coupling is made by inserting one ring inside the other and placing the rings parallel so that the flanges catch the ends and hold them

fast. The tubing is supported from a wire attached to sprags placed at 15-ft. intervals in the roof. Suspension hooks, furnished with each section, are placed in brass eyelets in the seam and the other end of the hooks slipped over the wire. "Blasting pieces" are provided so that the extension of the tubing may be carried up to the face of the drift, and, when the time for the blasting arrives, the extended portion can be quickly removed. The blasting piece has special snap hooks that attach the piece to the wire and provide a simple fastening that is easily handled.

Portable Scoop Conveyor

A new type of portable belt conveyor which has found a ready market is manufactured by the Portable Machinery Co., Inc., of Passaic, New Jersey.

The machine is operated either by electric motor or gasoline engine and is known as the scoop conveyor because the conveying belt receives its material from a scoop which can be pushed into or completely buried in the material to be conveyed.

The object of the scoop conveyor is to provide a portable machine that can be readily handled by one man for the purpose of loading and unloading, stacking



NEW TYPE OF PORTABLE BELT CONVEYOR

and reclaiming loose materials such as coal, coke, ashes, crushed stone, sand and gravel.

From the accompanying illustration it will be noticed that the scoop conveyor has a wide range of application. The manufacturers claim that it will handle sacks, packages, boxes and various manufactured products

and that one man with this conveyor will handle loose materials at the rate of 1 ton in 1½ minutes.

Keeping cars and trucks moving and cutting cost of hand shoveling is a necessity under present-day operating conditions, and a large number of well-known manufacturing concerns are already using from 1 to 10 of these machines for this purpose.

New Grinder for the Drill-Sharpening Shop

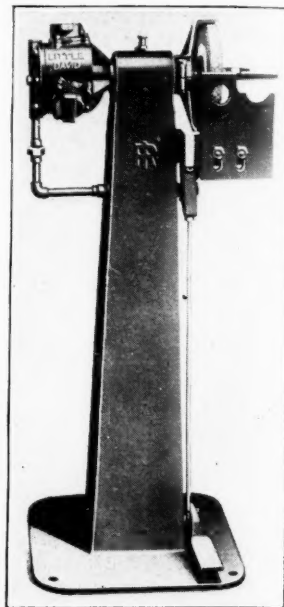
Better results are obtained from drilling machines if adequate attention is given to the forming of bits and shanks on rock drill steels. Properly designed machine sharpeners forge both bits and shanks so that these are formed perfectly and gaged accurately. A punching machine enlarges the hole in hollow steel to its proper size. But one thing remains, the squaring off of the drill shank.

Imperfectly made shanks—that is, shanks not square on the end—are the chief cause of drill piston breakage. This is an expensive item not only in the cost of replacement but also in the time that the drilling machine is out of commission. Furthermore, with imperfect shanks it is not possible to take advantage of the full force of the piston blow, and drilling speed is retarded.

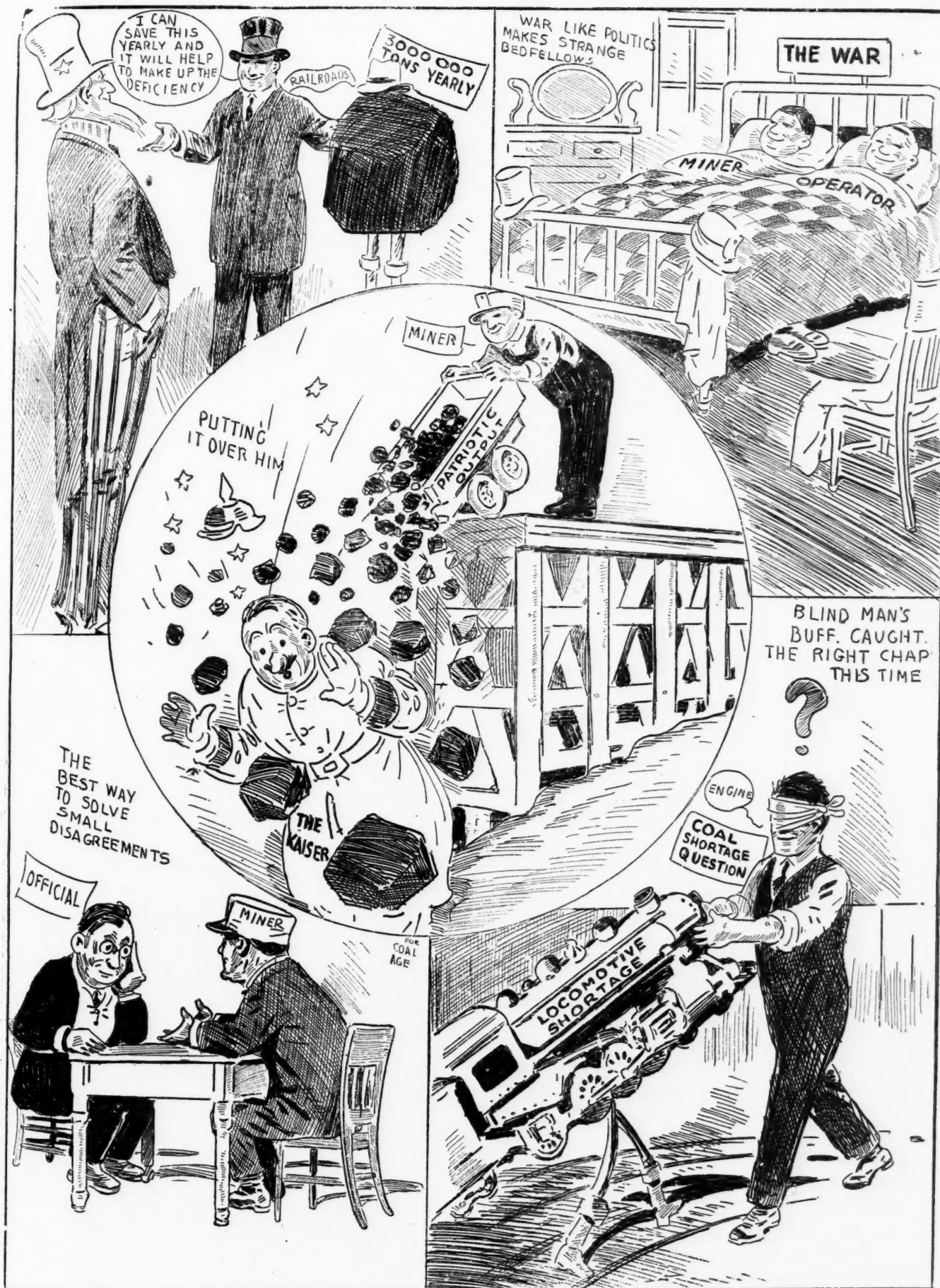
As a help in securing shank perfection, the Ingersoll-Rand Co. has developed the "Little David" pedestal grinder, an illustration of which is shown herewith. This tool, like the sharpener and punching machine, operates on compressed air. It is light in weight, readily portable and requires only a planking support. The powerful three-cylinder motor operates in a bath of oil.

A single foot lever controls the machine, leaving the blacksmith free to hold the steel with both hands. Ordinarily the grinding wheel used is 8 in. in diameter with a 1-in. face. As a further convenience the spindle is fitted with a No. 2 Morse taper socket to take a rose reamer for countersinking the hole in the end of the shank. This operation guards against cutting the water tube of the drilling machine.

This grinder also finds employment in truing the edges of drill bits, pointing picks and grinding other tools around the blacksmith shop. The complete machine weighs 195 lb., is 44½ in. high and occupies a floor space 17 x 20½ in. It operates satisfactorily with air pressures of 60 to 100 lb. per square inch.



AT A MINE IN PENNSYLVANIA 3¼ tons of coal are mined for each employee when all names on the payroll, in whatever capacity, are considered. In the coke region one man is employed for every coke oven. Assuming that there are four dependents for each worker, the population to be provided for in mining camps can be approximately determined.



How the Coal Age Cartoonist Sees the High Lights in the National Coal Situation

Ice Gorges Cause Serious Damage

To break up the recent heavy ice gorge in the Monongahela River in the vicinity of Brownsville, Penn., it was necessary to resort to the use of dynamite. Brownsville is in the heart of the coal-mining industry of the Monongahela Valley, and when the first ice gorge broke it caused much damage to the coal interests of that region. A second gorge that formed soon after the first added considerably to the havoc wrought by the masses of drifting ice.

The towboat "Alicia," valued at \$50,000, and owned by W. Harry Brown, a large coal operator, was caught in one of the ice jams and put out of commission.



TOWBOAT CAUGHT IN ICE JAM

Every effort will be made to save the boat after the ice has run out. An idea of the condition of the Monongahela River during one of these ice jams can be had from the accompanying illustration.

A partial list of the damage caused by the forming of these ice gorges is as follows: Maxwell tipple of the H. C. Frick Coke Co.; swept away; loss estimated at \$9000. One heavily loaded coal barge owned by the H. C. Frick Coke Co.; sunk; loss, \$3000. Delworth tipple of the H. C. Frick Coke Co.; swept away; loss placed at \$9000. Knob tipple of the Pittsburgh Coal Co.; wrecked; loss, \$5000. Three abutments, a supply house and 75 ft. of steel track, together with two loaded coal barges swept away, owned by Reliance Coal and Coke Co.; loss placed at \$15,000.

War-Time Conditions Bring About High Fatality Record in Coal Mines

The demoralization forced upon the coal-mining industry by war-time conditions is said by the Bureau of Mines to be responsible for the highest fatality record from accidents in that industry in the last seven years. During the year 1917, there were 2695 men killed in coal mining, which is an increase of 470 over the previous year. Said Secretary of the Interior Lane, in speaking of this matter recently:

At least, temporarily, it gives a black eye to the splendid efforts of the Bureau of Mines in its campaign with the miners and mine operators for safer conditions. Until the war struck us there had been a constantly decreasing death

rate which was much gratifying to the men of the Bureau of Mines as well as to myself. There had been the utmost coöperation between the industry and the bureau, and it had begun to appear as if we had passed those disgraceful days when human life was cheaper than a mine mule.

Although the war has changed all this for the time being, it is still our duty to analyze and see if we cannot correct some of the conditions even during the war, for a single life saved is not only humane, but a step toward victory. The unfortunate death toll of last year is undoubtedly due to the fact that the industry has been speeded and retarded spasmodically throughout the year. There was the unusual demand for coal, the uncertainty of prices at the mines, the failure at times of the transportation facilities, and the changing of markets to avoid long unnecessary hauls, the difficulty in obtaining experienced men to offset enlistments, the draft, and miners voluntarily returning to their countries in Europe to take part in the war. All these factors combined against the best efforts of the operators to produce coal in sufficient quantities to keep the country supplied with the necessary fuel, and also to have the safety conditions which we expect.

The speeding up of the mines at times, under the circumstances, was conducive to a high death rate. Mines found themselves short of labor and compelled to employ new and inexperienced men from other fields. Many of the experienced mine foremen and safety engineers had either enlisted or been drafted into the army, or obtained more remunerative employment elsewhere, with the result that less experienced foremen had to be placed in charge of some of the workings. With the exceedingly large demand for coal, it was not possible for the operators and others concerned to give as much attention to accident prevention at the mines as in recent years under normal conditions.

Mines which have not been able to obtain an adequate supply of coal cars have been operated only part time, which again is not conducive to safe conditions. This has resulted in an increase of certain dangers, especially those due to gas, dust and falls of roof, which would not obtain in the case of the mines operating full time. An active mine will ordinarily be kept in better condition than one operated only part time.

The remedy, therefore, both for a sufficient supply of coal and greater safety for the men lies in a continuous, steady flow of coal from the mines, without these overstraining bursts of speed and these part-time operations that led to a neglect of the usual precautions in the mine.

I am satisfied, from what the industry has done in the past, that this year with the bettering of the conditions over which the operators have had no control, there will be a greatly increased production of coal and without an unusual sacrifice of life. Given the proper encouragement and co-operation, the coal-mining industry will not fail.

Coal Handled by Milwaukee Dock Companies During 1917

The following table shows the amount of coal handled by the various companies at Milwaukee during 1917:

	Anthracite, Tons	Bituminous, Tons	Total Tons
Milwaukee-Western Fuel Co.	567,381	1,199,604	1,766,985
Lehigh Valley Coal Sales Co.	166,347	.....	166,347
Philadelphia and Reading Coal and Iron Co.	25,175	.....	25,175
Kanawha Fuel Co.	8,500	.....	8,500
Central Coal Co. ....	.....	217,006	217,006
Youghiogheny & Ohio Coal Co. ....	.....	59,112	168,766
Gross Coal Co.	109,654	20,307	48,452
Callaway Fuel Co.	28,145	271,808	271,808
Wisconsin Coal and Dock Co. ....	.....	1,093,335	1,093,335
Milwaukee Coke and Gas Co. ....	.....	10,646	10,646
Illinois Steel Co. ....	.....	121,241	121,241
Milwaukee Gas Light Co. ....	.....	23,553	29,098
Joseph Schlitz Brewing Co.	5,545	7,039	7,039
A. F. Gallun & Sons. ....	.....	1,907	13,698
North Side Coal Co.	11,791	.....	.....
Grand total.	922,538	3,025,558	3,948,096
1916.	853,217	3,737,167	4,590,384
1915.	1,085,745	3,785,076	4,870,821
1914.	1,044,912	3,891,128	4,936,040



Uncle Sam Needs Your Savings To Feed, Clothe and Protect Your Boy "Over There"



[Men of the coal industry who find it necessary to get to the national capital on business these days are invited to avail themselves of the facilities afforded by the Washington Bureau of "Coal Age," which is centrally located in the Union Trust Building. The bureau is in charge of Paul Wooton, who is in a position to be of material assistance to those who have business to transact with Government officials. Have your mail addressed care of "Coal Age," Room 307, Union Trust Building, Washington, D. C., while at the capital.—Editor.]

Weekly Production Statistics

Better car supply during the week ended Feb. 16 allowed the bituminous coal mines of the country to pull decidedly away from the low production average of December and January. The production for that week amounted to 11,084,000 tons, according to the estimate made by the United States Geological Survey. Beehive coke production also increased markedly. It was 557,000 tons for the week ended Feb. 16. Anthracite shipments were 35,486 cars as compared with 32,011 cars during the week preceding. Byproduct coke production was 381,973 tons. For the week ended Feb. 9 the bituminous mines were operated at 64.4 per cent. of their capacity. Practically 28 per cent. of the loss was due to unfilled car orders.

Domestic Consumers Advised To Buy for Next Winter's Requirements

There is a tendency on the part of some to believe that the coal situation is a past issue, now that the weather has moderated. It is pointed out at the Fuel Administration, however, that this is in no way the case. While the acute demand for domestic coal is easing off somewhat, there is every reason to believe that the problems presented by the coming year will be more difficult to solve than were those of the coal year about to close. The industrial demand for coal is sufficient to take every pound of coal produced. Domestic consumers, it is believed, will do well to lay in their actual requirements of coal as early as they can secure them. Every effort will be made, however, to prevent overstocking. The retailers are expected to contribute importantly in this effort. It is feared that the experiences of the domestic consumer during the unusually hard winter just passing will tend to a general desire to hoard coal for next winter.

New England Not Receiving Enough Coal

It was the fear of losing labor rather than an increase in coal supply that caused New England to follow closely after the Federal Administrator in suspending the fuelless day order. The demand for labor outside of New England, where six days full time was assured, was having a demoralizing effect on industrial organizations in New England states. The absolute requirements of New England were fixed at 1000 carloads of coal daily. During the first half of February, however, statistics show that receipts have not averaged over 300 cars daily. On only one day during that period did the aggregate receipts at all the New England gateways reach 500 cars. An improvement in delivery during the latter half of February is expected as a result of improved weather conditions. The ice in Long Island Sound is giving less trouble, presaging increased deliveries from southern tidewater ports.

Zoning Plan of Fuel Administration Rapidly Assuming Shape

The Fuel Administration's zoning plan is rapidly assuming shape. A tentative program, which will follow in a somewhat general way the proposal of the railroads, is being concluded. The zones, however, will be considerably broader than are those in the plan submitted by the railroads.

It is now clear that there can be no great limit set on the movement of Lake coal to the Northwest, but the all-rail movement from West Virginia and eastern Kentucky for that section of the country will be cut off. The supply of smokeless coal for Illinois and Indiana will be very largely curtailed. The only way that it will be possible to move coal from one zone to another will be by special license. Every effort now is being made to fix exact boundaries for the various zones. This is complicated by the fact that some of the zones will be broader in the summer than after Oct. 1, when weather conditions will necessitate some restrictions.

Another important element entering into the fixing of the boundaries is reports from the railroads as to their ability to move the coal as prescribed. Director General McAdoo has directed his operating office to report at the earliest possible moment on this phase of the matter. The zone boundaries must be fixed before Apr. 1, so that purchasers may know where they may buy and operators be informed as to the territory from which they may accept orders.

Director of Bituminous Coal Distribution

Carrying out his plan for the placing of coal distribution in the hands of practical coal men, J. D. A. Morrow, the manager of distribution for the Fuel Administration, has secured the appointment of A. W. Calloway as director of bituminous coal distribution. Mr. Calloway is president of the Davis Coal and Coke Co., at Baltimore, and occupies the same office with the Terminal Railroad and Coal Co., of Pittsburgh. Competent coal salesmen and shippers will be placed in charge of various subdivisions of Mr. Calloway's work.

New Prices To Be Announced by April 1

All applications for price revision now pending are to be acted on by the Fuel Administration before Apr. 1. The matter of dirty coal also is to receive prompt attention as is the recognition of different qualities of coal. Accompanying an announcement to this effect, made to "relieve uncertainty on this score as far as possible before the beginning of the new coal year," was a statement that is exciting considerable comment. It is: "The Fuel Administration believes that it has devised a speedy and accurate method for using the cost information which it has in hand, and that it has worked out the fundamental principles which should guide it in considering applications for modifications of coal prices."

No Change in Distribution of Anthracite During 1918

Anthracite distribution during 1918 will be the same as during 1917, insofar as Fuel Administration officials now know. Statements to the effect that no anthracite is to be permitted to go to the Lakes for transportation to the Northwest or to be handled by rail to any of the Western states were declared to have been unauthorized. In fact, a delegation of anthracite men, who visited Washington a few days ago, was authorized to take orders on the basis of the same distribution as was made last year.

First of So-Called "Nonessential" Industries Is Restricted in Use of Fuel

Particular significance is attached to the order of the Fuel Administrator which limits the use of fuel for the production of window glass to 50 per cent. of the amount manufactured in 1917. This is expected to be the forerunner of further curtailments of unnecessary activities which require the use of fuel. Fuel Administration officials have wracked their brains on the multitude of problems growing out of any determination as to what are nonessential industries. As a consequence, they avoid application of the term "nonessential" whenever it is possible. The agreement with the window-glass manufacturers is indicative of the new line of procedure in the attack on the nonessential-industry question.

For several months, special surveys of certain industries have been in progress. One of the developments of this reconnaissance was that the window-glass in-

dustry was likely to manufacture 50 per cent. more common window glass in 1918 than would be required. A conference with manufacturers developed that the majority was willing to reduce production 50 per cent. under the condition that all competitors would be bound by the same restriction.

Figures compiled by the Fuel Administration show that the curtailment of window-glass manufacture will save 500,000 tons of coal during this year and will keep 18,000 carloads of merchandise off the railroads. By extending to all industries the policy that no fuel is to be used to manufacture any greater quantity of finished products than are actually needed this year, and by effecting widespread economies in the use of fuel, a repetition of this winter's shortage of coal can be avoided. Fuel Administration officials do not expect coal production from Apr. 1, 1918, to Apr. 1, 1919, to exceed by more than 5 per cent. the production during the twelve months preceding. For this reason no reliance is being placed on increased production, but every effort is being made to prevent the use of fuel in the manufacture of a surplus of products not needed during the current year.

Would Discontinue Special Assignment of Railroad Cars to Mines

A radical change in the method of supplying the railroads with coal probably will be made in the near future, it is believed here. That all concerned may have a chance to be heard, the Fuel Administrator has called a general conference for Mar. 1. Since the disposition of 175,000,000 tons of coal is involved, it is expected that the conference will bring to Washington a large number of coal operators, railroad officials and others interested. The National Coal Association has recommended that railroad fuel be supplied by the district representatives of the Fuel Administration and that the special assignment of railroad cars to mines be discontinued.

Brief Washington Notes

By reducing the number of stops made by electric cars, the Fuel Administration predicts a fuel saving of 1,500,000 tons of coal a year. This is the latest important step taken by the conservation division.

The additional \$1.35 a ton allowed on export and bunker coal will apply only when such coal is placed aboard foreign bound vessels. An interpretation of the bunker coal ruling by the Fuel Administrator prohibits the billing of coal at the special bunker price until the coal is actually aboard.

January's coal production is 5,000,000 tons short of the production attained in January of 1917. The showing was even worse than that during December. The Geological Survey, which gives out the figures, attributes "this alarming depression" to an "unprecedented congestion of the transportation system of the country induced in part by unusually severe weather."

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

The anthracite region has been having quite a few strikes. The United Mine Workers unfortunately cannot excuse itself and deny its responsibility for them, as its men are now among those who are striking. We plead with them to leave such matters to the Conciliation Board for decision. Their interest and the interest of the country seconds this appeal. The conciliation board is not partisan, and it is best to leave adjudication where it rightly belongs.

The bituminous regions of central and western Pennsylvania are just now showing a better spirit than the anthracite region. The biennial convention of District No. 5 of the United Mine Workers met at the Moose Temple, Pittsburgh, Penn., on Feb. 22, and when some delegates sought a readjustment of the slate-handling question and of some other working conditions in the district, their action was quickly squelched by voting the "previous question."

WESTERN PENNSYLVANIA MINERS WORKING WELL.

The scale is settled; the men are making better pay than ever before—when they work—so why even appear to violate a contract duly made which the companies have repeatedly revised, whenever new conditions involved new disadvantages to the wage earner?

The Czecho-Slovaks, who form 40 per cent. of the mine workers of the district, and, with the Poles, form 60 per cent., introduced and succeeded in passing a resolution petitioning President Wilson "to continue to stand firmly for the emancipation of the Czecho-Slovaks from the rule of the Teuton-controlled Hapsburg monarchy"—a most excellent resolution.

A vote was taken and the delegates were found in favor of spending \$5000 for an educational campaign among the miners for the establishment of cooperative stores. Hitherto the Miners' Wage Scale Committee has consisted of the district president, the vice president, the secretary and the executive board. It was decided that henceforth seven other members would be elected to represent the seven subdistricts.

ILLINOIS ROUGH HANDLING DISLOYAL WORKMEN.

In Illinois, the mine workers are thoroughly imbued with the war spirit. It fares ill with any who are believed to be lacking in it, as is well instanced by what happened to Henry Martini when he refused to give back to Victor Saccaro the job he occupied before he left for service in the navy.

It is said by District Attorney Knotts that an investigation by Federal authorities failed to find any evidence that Martini was disposed to be unpatriotic. It is said that the matter was nothing more or less than a labor dispute, into which patriotism did not enter except as a reason for continuing at work. However, if Martini really said that the man should look to the navy for work, he cannot be exonerated.

The Peoria meeting is exhibiting the excellent spirit of the Illinois miners. The union in that state has subscribed for \$350,000 of Liberty Bonds, of which \$100,000 are already delivered. They expect to buy in all \$500,000 worth of these bonds. The organization in the state has roughly \$2,000,000 put by.

In Alabama the union has ordered the mine workers back to work and an arbitrator has been appointed by the Federal judge. The "big stick" of the Fuel Administration will probably smooth out all difficulties.

The delegates of District No. 18 met at Fernie, B. C., on Feb. 19. The district includes all southeastern British Columbia and the Province of Alberta. During the past

year its authority has been extended by the unionization of the mining camps north of Edmonton, along the Canadian Northern and Grand Trunk railroads. The miners at the Drumheller mines are highly incensed at the action of the Northwestern Mounted Police in bringing up a machine-gun to keep order in that district.

The Scottish miners at a conference in Glasgow, Scotland, on Feb. 22, decided against the Government manpower bill, under which more miners would be called into the army. The New South Wales Government intends to nationalize all the mines in the state and has agreed to supply the states of Victoria, South Australia and West Australia with coal for five years.

National Board of Labor Called

Feb. 17, the first 10 members of the new National Labor Board were named; five of these represent the employers and five the employees. The National Industrial Conference Board and the American Federation of Labor were to choose two other representatives on the board. On Feb. 27 the latter selected Frank P. Walsh, of Kansas City, Mo., formerly chairman of the Industrial Relations Commission.

The representatives of employers are: Loyal A. Osborne, New York, vice-president of the Westinghouse Electric and Manufacturing Co., and chairman of the executive committee of the National Industrial Conference Board; Charles F. Brooker, Ansonia, Conn., president of the American Brass Co.; W. J. Vandervoort, East Moline, Ill., president of the Root & Vandervoort Engineering Co.; L. F. Loree, New York, president of the Delaware & Hudson Railroad Co., chairman of the board and executive committee of the Kansas City Southern Railroad Co., president of the Hudson Coal Co., Northern Iron and Coal Co., and Schuylkill Coal and Iron Co.; C. Edwin Michael, Roanoke, Va., president of the Virginia Bridge and Iron Co.

The representatives of the workers are: Frank J. Hayes, president of the United Mine Workers of America, Indianapolis; William L. Hutcheson, president of the United Brotherhood of Carpenters and Joiners of America, Indianapolis; J. A. Franklin, president of the Brotherhood of Boilermakers and Iron Shipbuilders of America, Kansas City, Kan.; Victor Olander, representative of the International Seamen's Union of America, Chicago; T. A. Rickert, president of the United Garment Workers of America, Chicago.

Labor Shortage in Hard-Coal Mines

Complete figures just tabulated show that the anthracite mine workers numbered 153,534 at the beginning of this year, divided as follows:

Occupation	Number of Men	Per Cent.
Miners.....	42,485	27.67139
Miners' laborers.....	22,705	14.78826
Company men, in mines.....	41,271	26.88070
Company men, outside mines.....	41,695	27.15685
Other mine workers.....	5,378	3.50280
Total.....	153,534	100.00000

With more mine workers there can be an increased production of anthracite. With the present labor supply it will be difficult to raise shipments much above the 77,133,000 tons reached last year.

Before the war, the number of anthracite mine workers was 177,000. In 1914, the number ran up to 180,899.

With the two wage increases last year, the wage scales since Dec. 1 last have been the highest ever paid in the anthracite industry. Every mine worker is now able to find employment at full time for six days a week, with the pros-

pect that such favorable labor conditions will continue indefinitely. How important this is will appear in the fact that taking a ten-year period to 1916, the average time which the breakers ran was only 221 days per annum.

Frequent Troubles in Anthracite Region

The anthracite region seems to have altogether too many strikes, and the Industrial Workers of the World cannot be blamed, at least, with some of them. Fortunately, the strike at the Enterprise colliery came to an end Saturday, Feb. 16. W. L. Connell, the owner of the mine, had assured District Board Member Hollister and other union leaders that the difficulties would be satisfactorily settled and on this score the union officials recommended the men to return to work. If Mr. Connell does not do what is expected, there is still the Conciliation Board.

In our issue of Feb. 16, it was recorded that the 1100 men and boys at the Archbald colliery of the Delaware, Lackawanna & Western R.R. Coal Department went on strike from Feb. 4 till Feb. 7. They struck again on Feb. 20 and returned to work Feb. 23. There is to be no change in working conditions.

On Feb. 19 the National colliery of the same company, located near Scranton, Penn., went on strike, 1900 employees being laid idle by that fact. Up to Feb. 24, the strike was not settled and no committee had taken up the grievance with the company officials, according to S. D. Dimmick, the assistant manager of the company.

On Feb. 19 a strike occurred at the Centralia colliery of the Lehigh Valley Coal Co., near Mount Carmel, in the lower anthracite region. The disagreement is about a requirement of the company that certain breasts, where about 20 men are employed, shall have two manways instead of one, one on each side of the breast. The men do not object to the order but they want pay for providing the second manway.

When the men refused to make the second manway without additional compensation, the company decided that it would not work the part of the mine where it desired to put two manways to a breast. The mine workers either quit the mines from preference or were compelled either to quit or work the two-manway places. The United Mine Workers of America took up the dispute with the company but without result, and a strike finally occurred. The men are breaking their agreement, of course, though it seems they were not hasty in doing so.

The miners wanted two-manway pay till the Conciliation Board ordered otherwise. The company, in the event of a favorable decision, would then have had to collect from the miner the excess money paid him, which might have been hard. The company elected to stand by the contract, which provides that the Conciliation Board shall decide the question and that the pay shall be regulated for the whole work under dispute both before and after award. On Feb. 22, James Matthews, the district president, got the men to agree to return to work and let the Conciliation Board decide on the merits of the controversy. However, on Feb. 23, Tuesday, the strike was still in full operation. The output of the colliery is about 2000 tons a day, the men numbering about 800.

The mine workers do not like the changes in the dues as made in the international constitution. These were made necessary by the lawsuits in which the union was involved and by the bonds it was necessary for the union to put up. The change becomes effective Apr. 1. The constitutional provisions which change the dues of the local unions from 25c. to 50c. per month for each member run as follows:

"Sec. 12—The local dues to be paid by each member shall not be less than 75c. per month, together with such assessments as may be levied by the different branches of the organization.

"Sec. 13—Every local union shall pay direct to the international secretary-treasurer a per capita tax of 50c. per month per member and such additional assessments as may be levied by an international convention, referendum vote of the members or in accordance with Section 25 of Article 9, payment of per capita tax to be based upon the amount of dues collected each month by the local union."

Unfortunate Dispute in Alabama

Both John P. White, the labor chief in the Fuel Administration and Rembrandt Peale, the operators representative have been sent to Alabama to settle the strike which threatened to spread by sympathy to mines which were not directly affected by the controversy. As Mr. Peale wrote the agreement in question, he is in close touch with all developments.

The problem for the Fuel Administration is whether to compel the furnace companies, which had the strikes, to abide by a contract that they have never accepted. It is quite possible that the Fuel Administration will decide that its will is law and must be obeyed. It used the big stick on the smaller companies, and they agreed to abide by the terms of an agreement of which they did not approve. It is hardly likely that it will tolerate the refusal of the larger companies to sign, or abide by, that contract.

At the same time the men working for the smaller companies which have signed the scale do not appear willing to abide by their agreement. They work longer or shorter hours at their pleasure instead of abiding by their pledge. The steel corporations have given their men no less than six raises in pay recently. They have concededly done more than anyone else to promote good conditions. Must they also accept a provision they regard as tantamount to recognizing the union?

By Feb. 18 the number of strikers had increased to 15,000, the Yolande, Rock Castle and Searles mines going on strike on that date, thus extending the strike to three new companies. The next day the Edgewater mine of the Tennessee Coal, Iron and Railroad Co., with 900 men, closed down. On Feb. 20, Frank J. Hayes, the president of the United Mine Workers of America ordered the coal miners in Alabama to return to work pending a settlement of the differences with their employers.

The Fuel Administration reported on Feb. 23 that H. C. Selheimer, of Birmingham, was selected as umpire. His appointment was approved by President McCormack, of the Alabama Coal Operators' Association and President Kennemer, of the Alabama branch of the United Mine Workers of America. The appointment was made by Federal Judge W. V. Grubb, of the Northern district of Alabama. The Administration has indicated that the mines are all in operation as usual, pending a settlement.

Apparently Mr. Selheimer has not been approved by the Tennessee Coal, Iron and Railroad Co. and the Republic Iron and Steel Co., but only by the coal operators' association, to which apparently these companies do not belong. They are not signatories to the contract. If they are brought to time it will be not under the agreement, but under the fiat of the United States Fuel Administration.

Mine Workers Take Public Action

The mine workers of late have been taking concerted action to secure their ends as ordinary citizens. They have just as much right to do this as engineers, bankers or lawyers. There is no reason why all action of mine workers shall be in direct relation to their industry. However, one might take some exception to the activities recorded below. Perhaps they are not well advised, but much public and political activity is subject to just such criticism. Mine workers are as much entitled as other groups to make mistaken decisions.

At a mass-meeting of miners from Shamokin, Kulpmont, Ashland, Centralia and Mount Carmel a drive was started to raise a fund of \$3000 with which to engage the service of an engineer to ascertain the physical value of the Shamokin and Mount Carmel Transit Co.'s trolley line, from which special rates to miners were recently withdrawn along with the six-for-a-quarter tickets and upon which a 6c. fare has been established.

The actions of the company have caused the mine workers to make vigorous protests to the Public Service Commission. Prominent attorneys have been employed by the mine workers, and it is the purpose of the miners to ascertain the value of the road, and in this way to prove that the increase in fare is not justified.

EDITORIALS

Make It a Little Easier for Weak-Kneed Patriots

THE weakest link in the whole national chain in this war is transportation by land and by sea. The greatest need is to strengthen this link. To do so will take much money, but with the Interstate Commerce Commission holding down railroad rates who knows what will happen when the war is over. Conditions may be even worse with the railroads than they were before the war started. We would all like to buy railroad stocks and bonds if only we knew that the money expended would come back to us. Many good patriots would be willing to buy them if they received interest equal to that paid on Liberty Bonds, or even no interest at all. All they are looking for is to conserve their capital.

Somehow we do not like to give away our money to the railroads. We are accustomed to give it to hospitals and the Red Cross, but we are not ready to buy stocks and bonds with the almost certain assurance of loss. Something must be done to finance the railroads either out of Liberty Bonds or from some other source. The public will not buy railroad securities till they become secure, and they can never be secure so long as they are the victims of politics.

The Manager's Idle Moments

UNFORTUNATELY, the mines in the bituminous regions are not working steadily. The idleness, however, gives the manager a chance to put his plants in order; and the necessity for keeping day men at work, as a means of preventing migration, affords a reason for employing the day hands at the mines for this purpose even when no coal is dumped.

There is therefore an opportunity to prepare for the days ahead. It will go hardly with the manager if his mines are laid idle for some internal cause when he has railroad cars on his sidetrack. The men will be discontented and leave him, his allotment will be cut down, and the mine owners will look for a more efficient man.

Consequently, the whole problem of mine management should be scanned again. Shortage of men has modified that problem immensely. Perhaps the haulage problem can be solved by closing down certain headings and openings. There is no cross-hauling at the mines, but there is something almost equally bad. In many places coal is being hauled from one section of the mine past another section that could be arranged to take care of the whole tonnage needed.

Most mines would be helped by greater concentration. The supervision problem is an important one. Most people regard the boss as a man who drives people to work. There is truth in that view, but it is also true that he is the man who helps men to work. He is the "liaison" officer at a mine. He coördinates effort. The

mine workers need him. They are entitled to his services.

No mine operation should lag for the lack of immediate authority. When the mine is large and rambling time is lost trying to get word to the boss, where, in a smaller mine producing the same tonnage, he is readily at hand. By concentration of its work many a mine crippled for lack of supplies could be enabled to operate efficiently. It could keep up its haulage conditions to a high degree of efficiency by reducing the length of road kept in operation.

Some companies have too many mines working. They would do better if they concentrated their effort on a few and ran them intensively. The equipment on hand would go further, and much water that is now pumped would automatically flow out of the swags to the drift mouths or the sumps. The machines would do more work, and the few roads maintained would be in better running condition.

Take a careful view of your duties and cut all red tape. The present conditions demand drastic remedies, and we must rise in every way to the occasion. There must be a lopping of nonessentials in our industrial operation. Because we needed more elbow room when men were plentiful is no reason for trying to use that elbow room now. Because we hoped that we could find men to operate a new drift is no reason why we should try to run it now that the men have not materialized. Every problem is a new problem. There are new conditions which modify it. It should not be solved as if the old conditions still existed, but on the conditions now surrounding it.

Are We a Nation of Individualists?

ONE of the evident signs that we are approaching an industrial and economic crisis is the amount of criticism that is being showered on those in charge of Government activities, nearly all of which at present relate to the war. The attempts to blame these various inefficiencies on individuals are being made on all sides. It was only natural in this confusion that army officers and Government officials in general should be the first to receive the blow, for we have always held the theory that Government officials were far more inefficient than our business men.

The number of applications from private manufacturers for the help of "efficiency engineers," which has so largely increased lately, is indicative of a realization on the part of many of our manufacturers that their methods also are not what they should be. The people who are applying for help are in many cases no worse off, as far as their methods are concerned, than others who have not yet discovered how badly they are doing their work.

The whole subject seems to resolve itself concretely into the fact that our business and industrial systems

are not suited for times like these, when it is necessary to combine all our energies and exert our full driving power toward the achievement of one supreme object.

We should not be surprised that this is the case, for our economic theory has never contemplated teaming up all the industries of this country for one object, but has rather discouraged that idea and encouraged individual competition of the most strenuous kind. In other words, we are a nation of individualists who have never really seriously contemplated coöperation for the common good.

When this problem of coöperation is suddenly put up to us, as it has been by the war, it is not surprising that our business men, trained in the individualistic school, should be entirely unfitted to solve the problem. Moreover, it might be expected that the men who have been most successful in individualistic, competitive business, in which profit was the main aim, should be actually the ones least fitted to establish a scheme of business and production for the benefit of the community. This is a new problem to them, and one altogether outside of their experience.

It is to be granted that such business men may have individually great driving power, but this very excess of driving power in individuals or corporations is likely to make the confusion all the worse, unless a means of coördination is established which will keep the driving power of the individuals or corporations in proper balance.

What to Do First

IT IS said that we are preparing to produce for the war in France much more than we can ship to that country. If that is true, we are riding to a fall. If we cannot find a way of placing the products we are making, we may as well spend some of our efforts on our domestic needs.

First of all come, of course, the merchant marine, the docks for the construction of vessels, the channels to reach those docks, the towns for the ship workers and all that will assist in the construction of ships. Then we need to spend money on railroad locomotives and cars. We cannot in the short time available do much toward increasing the capacity of our railroads other than in regard to terminal facilities, but these should be of the best.

Motor-truck transportation should be allowed to replace horse transportation, and this will keep the automobile factories busy. As we have now to supply the Allies with grain without help from Russia, Australia and India, it is essential that we have increased grain-handling facilities so that none of our bountiful harvests shall be lost by lack of provident care. Consequently, grain-elevator service will probably have to be developed. Furthermore, we should enable our lakes and canals to serve our transportation needs more fully.

Unfortunately, governments are apt to take an interest only in what are stereotyped government activities. Until the United States took over the railroads it did not seem to care a jot that the industry was going progressively to destruction. That was a matter left to the railroads, as if the railroads were not one of the essential limbs of the nation, a limb which could not

suffer without all the other members suffering with it. Even now the railroads do not seem to be getting the consideration they deserve.

The innate militarism of mankind resolutely sets itself against seeing war as a great big business to be conducted on business principles. It is not merely shot and shell, but the conduct of a national life that is demanded; and we must look ahead to see that the indirect sources of our power are not forgotten and allowed to become inept even though they happen to look unmilitary and quite indirectly of assistance in the war. The transportation matter should have been carefully considered when we were "being kept out of war." Then was the time when we should have been fostering an arm which keen observers had noted for years was progressively becoming paralyzed. A diagnosis would have been quite easy to any who resolutely set himself to find the cause.

These needs must always be kept in mind. The wealth of the country must be carefully directed so it will help in solving them. Money should be guided to the civilian industries which need speeding. The Government should not only forbid the sales of stock in nonessentials, but it should indicate to the public those lines of industry which will need financial encouragement and investment if the war is to be won with minimum difficulty. Steel and byproduct plants need some such a word of encouragement from the Government authorities. Unfortunately, too many of the elective princes of our country show a positive aversion to industry because they have not set their seal upon it. Trade is vulgar and only statecraft, politics and the waging of war, they feel instinctively, should occupy the time of those who are given the work of governance.

So it comes we act like the young cub who was given charge of a company store. The first day he took charge he bought \$400 of perfumes. With due pushing, such a line would hardly have been sold out in 10 or 15 years. Yet a week after he was out of flour. The essentials of living had not appealed to him. Some of the makers of our nation have an equal failure to understand the basis of our national existence.

Fuel Administration Striking Its Gait

LIKE most hastily constructed organizations that are given unlimited powers, the Fuel Administration in Washington has been a mushroom affair. Little by little system has developed out of chaos, until now really effective work is being accomplished.

Coal operators will no longer have occasion to fear the consequences of ill-advised regulations promulgated by men inexperienced in coal mining. A carefully selected committee composed of some of our best-known mining engineers is now preparing the data on which prices are based. Mr. Leshner has a world of information that is proving invaluable to those perfecting zoning plans. Mr. Morrow, in bringing to his aid men like A. W. Calloway and H. N. Taylor, is doing a service that cannot help but foster the confidence of the industry. Coal men will likely have to make many sacrifices and put up with numerous aggravations. However, these recent moves at Washington cause us to feel that injustices will not be rendered.

DISCUSSION BY READERS

The Fuel Situation

Letter No. 1—It is a well-known fact that the little things in life are the most decisive and often exert a powerful influence for good or bad. Too often it happens that our devotion to minor matters obscures the broader vision that is so necessary for the successful management of large undertakings. But the greater and more influential the part we play in our everyday life, the less is our mind absorbed in the consideration of unimportant details, which should always be subordinated to the main proposition.

The fuel situation, today, which has been fully set forth in *Coal Age*, is a large proposition, requiring the broadest vision possible. To meet the growing complications incident to the production of coal at the mines and its transportation to market and distribution to points where it is most needed, the Government, some time since, organized a Fuel Administration, whose avowed purpose was to increase the production of coal, and to insure the nation an adequate supply of fuel to meet the increased demands for the war.

WORK CONFRONTING THE FUEL ADMINISTRATION

Kindly permit me to submit to the readers of *Coal Age* the question of whether this policy has been carried out by the Fuel Administrator. Personally, I am inclined to think that he has confined his attention more to the curing of some of the many prevailing evils in the coal industry, rather than overlooking these, for the time, and giving his entire attention to increasing the supply of coal.

It is true there have existed many hindrances and, to relieve the congestion of traffic and increase the means of transportation of coal, embargoes on freight have been proclaimed and industries have been forced to observe workless days. The price of coal to consumers has been reduced and jobbers' "gouging" commissions curtailed. Statistics show that more coal is being produced, today, than ever before; and, to assist in its distribution to where it is most needed, producing and consuming zones have been established for the purpose of avoiding cross-hauls.

Notwithstanding all this, however, the nation is today suffering from a serious shortage of coal. While it is easy to charge this unhealthy state of affairs to the inefficiency of the Fuel Administration, we must admit that it is another matter to blazon the path to efficiency. We are all critics at heart and, while this is largely justified in respect to the present emergency, we must admit that what the nation needs is constructive criticism. It must be remembered that it is wrong to pull down unless we can rebuild something better.

In respect to the work to be performed by the Fuel Administration, it is only possible to suggest, in a general way, that the closest attention should be given to big things, while matters of minor importance are

left to shift for themselves. Let the Administration strive to adopt an expansive and liberal policy, keeping clearly in mind the need of increasing the production of coal, and transporting and distributing the output to the centers where it is most needed.

Let us hope that there will be the heartiest cooperation on the part of the Administration, the coal mines and the railroads, which alone will enable them to increase their services to the nation. The great cry of the country today is "service," and what is needed to accomplish this is the larger vision and comprehensive grasp.

N. H. S.

Boston, Mass.

Working the "Rooster Coal"

Letter No. 1—Replying to the inquiry of Mine Foreman, *Coal Age*, Feb. 16, p. 349, asking for information in regard to the working of what is known as "rooster coal," which occurs, in many districts, in connection with the Pittsburgh seam, let me say that I have had some experience with this coal, in a district where it was probably above the average both in thickness and in quality.

In the district to which I refer, the rooster coal reached a thickness of 4 ft. in places, but would thin out to 2 ft., perhaps not 50 yd. away and, at times, the thickness would vary that amount in a single room. My experience with this coal is that it is most variable also in quality and, frequently, half of it must be thrown out as being unmarketable. The result was that, in this locality at least, the seam would hardly pay to work separately.

The section of the seam, as given on page 349, is almost identical with that in the locality I have mentioned; but the drawslate varies much, reaching a thickness of 4 ft., in places, and again thinning out to 6 in. I have known the shales overlying the drawslate to vary from 8 ft. in thickness to barely 3 ft. in some places. Indeed, I understand that the two seams almost come together, in certain sections, but I have never found it so in my own experience.

VARIABLE CONDITIONS FORBID ROOMWORK

Referring to the question of the feasibility of working this seam, I would not say that it is ever practicable to do this in driving the rooms, chiefly because the roof above the rooster coal is quite variable, consisting of a hard sandrock, which is frequently replaced by shale.

It is well to observe here that the shale separating the two seams does not make a good roof in rooms. I have even seen it start to break on a narrow entry and it became necessary to take down the loose material up to the rooster coal, in order to avoid frequent roof falls. In one instance that I recall, we were obliged to handle 6 ft. of this shale roof over a sidetrack where it was impossible to support it, although the place was well

timbered with center posts set between the tracks. This made a large amount of rock to handle and was expensive.

Although the method we employed in working these seams resulted in recovering hardly more than 60 per cent. of the rooster coal, I do not know that it could be improved. Briefly described, it was as follows:

When the heading had advanced far enough, No. 1 room was turned in the lower seam. This was driven up in the usual manner and when it was finished the miner pulled the rails back a distance of about 30 ft. from the face and drew the props, allowing the roof to fall in that space.

ROOSTER COAL WORKED OUT RETREATING

This being done, the miner cleared a passageway to the edge of the fall so that a car could be pushed close up to the slate. A shot was then put up in the rooster coal, which was allowed to fall on the slate. Frequently, it was possible to load this coal directly into the car, from the top of the fall, while at other times it was necessary to throw the coal to the bottom before loading.

No. 2 room was worked in about the same manner, except that the pillar between rooms Nos. 1 and 2 had to be drawn. This was done by making about two cuts of a Goodman shortwall machine. I have seen 12 to 14 pillars taken out before the top rock would break above the rooster coal. At other times, however, I have known it to come down on top of the coal.

Permit me to say, in closing, that I consider this method as practicable as any that can be employed and would only suggest one change. That is, if possible, the headings should be driven up their full distance before any rooms are turned. Then drive six rooms abreast at the inby end of the heading. When these have reached their limit start to draw the last pillar and follow this with the others in order, carrying the gob line at an angle of about 45 deg. with the heading.

I believe this plan would be a considerable improvement over the previous method, as it would be impossible to recover the entry stumps more completely, as quickly as the pillars are finished in the rooms. There may be places where it would be possible to drive entries and rooms in the rooster coal, but this has not been my experience.

THOMAS HOGARTH.

Heilwood, Penn.

Shaft vs. Slope Opening

Letter No. 6—This discussion recalls to my mind the serious difficulty I once experienced in trying to keep a slope open in the summer time. There were continual falls of roof taking place, owing to the rapid decay of the timbers caused by the alternate dry and wet condition of the slope at that time of the year. Much trouble was caused also by accumulations of ice in the winter time. I will not go further into detail than to say this slope was driven on the dip of the seam.

My experience in operating slope mines has been such that I have no hesitancy in saying that two shafts are much to be preferred to two slopes, when opening a mine. There may be conditions, of course, when a slope opening would naturally be chosen, especially in the working of an inclined seam that outcrops on the property. However, in all cases where the seam is level

and lies at a reasonable depth below the surface, my preference is for a shaft opening.

In respect to the expense of sinking, there will be more rock to handle in sinking a shaft 10 x 20 ft. and 118 ft. deep than when sinking a slope, on an inclination of say 30 deg. and having a cross-section of 6 x 10 ft. The slope would be practically 236 ft. in length. When the shaft is once down and properly timbered, however, it will not only cost less to maintain and cause less delay in hoisting than a slope opening, but will afford the quickest means of ingress and egress to and from the mine.

In the operation of a shaft mine, I would arrange to lower and hoist men at the hoisting shaft, until such time as the output of coal was sufficient to keep the engines running continuously throughout the shift. In that case, the men would be hoisted at the second opening, which should be equipped with means for that purpose.

LUMEN.

West Leisenring, Penn.

Electrically Driven Mine Pump

Letter No. 1—I have been much interested in the inquiry of John Martin, *Coal Age*, Jan. 26, p. 214, in which he describes the difficulties experienced in the operation of an electrical mine pump.

Mr. Martin attributes these difficulties to the fact that the 5-in. discharge pipe of his pump extends but a short distance from the pump and then connects with an 8-in. pipe line. This is a very similar arrangement to the installation in the mine of which I have charge, and which has given the best of satisfaction. For this reason, I believe that the difficulty, in Mr. Martin's case, arises from other causes.

In our mine, I am operating an electrical pump having an 8-in. suction and an 8-in. discharge, the latter being connected, at a little distance from the pump, with a 10-in. pipe line. This installation, however, differs somewhat from that described by Mr. Martin, as our slope has a grade of only 6 per cent., instead of 23 per cent., as in his case; but the slope is 2700 ft. long, while Mr. Martin's is only 800 ft. long. Therefore, while we are working against a static head of 162 ft., as compared with the 200-ft. head, in his case, yet, the greater length of our pipe line will increase the friction head so that the two cases are practically the same in this respect.

As I stated previously, we have experienced no trouble whatever, except at one time when the pump was started with the discharge valve closed, and the result was that the driving rod of the pump was broken and the shaft bent.

Allow me to suggest that, in my opinion, Mr. Martin's difficulties may arise from one or both of two causes: Either (1) the pump is too light for the work it is required to perform and, owing to the inertia of the water column when the pump is started, the piston rod is bent or the journal casting broken; or (2) it may be that the foundation on which the pump rests is too light or insecure, allowing the pump to shift its position slightly, which would throw it out of alignment and produce the results he has described. I hope these suggestions may be of service to Mr. Martin.

McIntyre, Penn.

SAMUEL JONES.

Shotfiring re Explosion

Letter No. 5—The recent discussion, in *Coal Age*, relating to shotfiring in mines, has called forth the interesting question of the inflammability and explosibility of the gases produced by the combustion of black powder, and this led to the present discussion of the relation of shotfiring to the possibility of starting an explosion in mines and, incidentally, involved the question of reducing the circulation of air in the mine at firing time, with a view to utilizing whatever extinctive effect the gases produced in blasting might have, as claimed by John Verner, *Coal Age*, Nov. 3, p. 774, and Jan. 5, p. 33.

Some years ago, I had occasion to investigate this subject and reached results that may be of interest in this connection. I first tried to obtain samples of the air, at the faces of rooms where shots had been fired but a few moments previous. In this attempt, I was not successful in securing satisfactory examples for analysis and it became necessary, therefore, to depend upon experimental work performed in the laboratory.

EXPERIMENTS WITH BLACK POWDER

In the experiments that were conducted, charges of black powder alone and the same powder mixed with various quantities of fine coal dust were fired. As a result it was found that the gases given off by the explosion, in some cases, would burn readily and even explode when mixed with air. The results of these experiments were published in the *Transactions of the American Institute of Mining Engineers*, Vol. 41, p. 454.

The combustible gases, which may be present in the fumes from black powder, originate from three sources: (1) The gaseous products of the explosion may contain insignificant amounts of combustible gas, even when the composition of the powder is such as is required to make its explosion complete. (2) The heat of the explosion may distill certain volatile combustible constituents of the coal. (3) When black powder is fired in the presence of fine coal or dust, the result is much the same as what would be obtained if the powder contained an excess of carbon. In that case, the nitrate would not be present in sufficient quantity to furnish oxygen enough to burn all the carbon to carbon dioxide and a certain amount of the monoxide would be produced, which is combustible.

WHAT THE EXPERIMENTS SHOW IS POSSIBLE

While such experiments do *not* show that combustible gases are invariably given off when black powder is exploded in the presence of coal, they *do* show that the explosion of the powder, under such conditions, may produce gases that are combustible. Indeed, the gases resulting from the explosion of black powder alone, under apparently uniform conditions, are not of constant composition; and, as has been shown, the presence of combustible gases resulting from the explosion depends on the composition of the powder and the coal.

But, since the presence of combustible gas will aid the explosion of coal dust, it follows that an explosion may occur, as has been suggested in this discussion, because of the possibility of such gases being produced when coal is blasted in a close place or heading. This is particularly liable to occur when a blownout shot projects

its flame into the gases and dust produced by a previous shot.

Many explosions have taken place, in Kansas, under circumstances which strongly indicate that powder fumes were concerned in the explosion. It is the custom there for shotfirers to work rapidly and sometimes several shots are exploded at nearly the same time. The holes are heavily charged with powder, and the conditions are favorable to the production of explosive gases.

In 1909, an explosion, in which powder smoke was supposed to be concerned, occurred in an Illinois mine. At that time, 182 shots had been fired and but four remained when the explosion took place. The explosion was attributed, by the mine inspectors, to the excessive use of powder in blasting the coal. C. M. YOUNG,

Assistant Professor of Mining Research.

Urbana, Ill.

Letter No. 6—Opinion, generally, seems to favor an increased circulation of air at the time of firing shots in mines, instead of reducing the quantity of air in circulation at such times. For my part, I cannot understand how it would be safe practice to fire shots in a mine generating gas, when the ventilating current has been reduced. Nevertheless, John Verner contends that this has been done with good results.

Practice and theory have always agreed that it was proper to maintain a good circulation of air in the mine, sufficient to remove all dangerous, explosive, or noxious gases as quickly as they are formed and thus keep the mine healthy and safe. We are taught, and it is common practice where the shots are fired by shotfirers after all the men have left the mine, to begin that work on the end of the air.

REASONS FOR MAINTAINING A GOOD AIR SUPPLY

It has been explained that where a good ventilating current is maintained the smoke and gases produced in firing will be swept out of the mine and the places in which shots are yet to be fired will be kept clear. It has even been suggested that the circulation, in certain sections of the mine, be temporarily increased by regulating the air passing into those sections where shots are yet to be fired. When the work is finished the normal circulation in such sections is restored.

It is reasonable to believe that, in a mine generating gas, a reduced circulation of air will result in a greater accumulation of gases in the working places, and this condition would certainly be conducive to an explosion taking place when shots are fired. Aside from this, however, shotfirers should not be asked to work in a reduced air current, which is always a menace to health if not to safety.

In regard to the inflammability of the gases produced in the explosion of powder, I have frequently tested this fact by igniting the gas in the crevice of a shot. It seems to me that this illustrates fairly well the condition that would exist at the working face if the circulation of air is reduced.

The same result is obtained whether dynamite or black powder is used and, sometimes, it is possible to ignite the gas produced by permissible powder. I have seen mice overcome by the deadly effect of these gases when venturing to crawl into what remained of an auger hole where a shot had been fired.

R. J. Pickett, in his letter, *Coal Age*, Feb. 9, p. 301, has referred to the dangerous practice of tamping holes with dummies filled with fine coal dust. I agree with him that this could not be done when the shots were fired with a needle and squib and the tamping had to be done more carefully. State laws, the instructions of powder companies, and one's own common sense warn against such practices.

It is poor argument to condemn the use of permissible powders when so little attention is given to properly preparing shots. These points cannot be too deeply impressed on miners whose prejudices are often deeply rooted.

In Indiana, in mines where no machines are used, I am informed that the prevailing practice is to shoot the coal off the solid and, if this is true, there is all the more reason for tamping the holes properly their entire length. The fuse should be of sufficient length that it can be lighted after the hole has been tamped fully to the face of the coal.

W. H. NOONE.

Thomas, W. Va.

Examination of a Mine

Letter No. 3—It would appear from the letter of Robert A. Marshall, *Coal Age*, Feb. 2, p. 256, that the mining law of Colorado requires the fireboss to make but one examination a day, which is done before the men enter the mine in the morning. According to his statement, on returning from breakfast the fireboss is supposed to do whatever work the mine foreman may find most urgent.

In my opinion, that is not a safe plan to adopt in the operation of a gaseous mine. It is my belief that any mine generating gas or dust in dangerous quantity should require the entire time of the fireboss, who should make a separate examination of every working place in the mine while the men are at work. He should also make a separate report of such dangers as he may find in going about the mine the second time.

When making his second round the fireboss is very apt to find men who are violating the mine regulations or some requirement of the mining law. He should, in every case, report the names of such offenders to the mine foreman, as the health and safety of the workers and the security of the mine depend on the strict compliance of the men with every requirement of the law.

THE SECOND EXAMINATION IN PENNSYLVANIA

The Pennsylvania Mining Law requires a second examination to be made by the fireboss while the men are at work in their places. It is the custom there for the fireboss to start to make his second round immediately on his return from breakfast.

This time, he examines each working place where the men are at work. He not only examines the place for gas and to ascertain the condition of the roof, but gives any needed instructions to the men, in respect to setting timbers and mining coal with safety to themselves and others. The fireboss also takes note of what material is on hand in each place and orders any further material that may be needed.

I heartily agree with Mr. Marshall in his suggestion that we should do everything in our power to sidetrack the Grim Reaper, who constantly lurks about the mine

seeking his victims. Where danger is discovered it is the fireboss' duty to withdraw the men from the place or remove the danger promptly. When a place cannot be made safe at once, a danger signal is placed at all entrances to the place and the men are withdrawn and not permitted to return to work, until it is again made safe. All such dangers must be reported promptly to the mine foreman, whose duty it is to give immediate attention to the removal of the danger.

Dubois, Penn.

ROBERT WILLIAMS.

Danger and Discipline

Letter No. 1—Referring to the fact that the fatality rate in coal mining has exceeded the tonnage rate, during the past year, the statement is made in an editorial, *Coal Age*, Jan. 12, p. 67, that "there is little question but that greater discipline would result in reducing that fatality rate." I can heartily indorse this sentiment, but wish to add that there is a wide difference between discipline enforced in the mine, and the posting of "safety rules," which are so frequently ignored.

It is not difficult for even the casual observer to see that coal mines are being operated today under strained conditions. The miner is urged to dig all the coal he can and, in order to assist him in doing this, discipline is neglected and safety rules are too frequently suspended in the effort to increase the daily output of the mine.

NUMEROUS CAUSES OF LAX DISCIPLINE

Mine officials charged with the enforcement of safety rules become lax and, as a result, the miner takes many chances. The patriotism of the miner should lead him to employ every energy in producing coal, but patriotism does not call for the neglect of mine discipline and the setting aside of safety rules.

Owing to the unprecedented demand for coal and the scarcity of men, the miners' wages have been increased. This has drawn many inexperienced men from the farms to work in the mines. The result is that the standard of competency has been lowered and the fatality rate is bound to be increased.

In addition to the employment of many incompetent men in the mines, the tendency of experienced miners to take advantage of the leniency of mine officials in respect to mining rules and regulations helps to increase the number of mine accidents.

Because an experienced miner can put out a good turn of coal he is not disciplined for his disregard of safety rules, which not only endangers his own life but is a menace to others. Seemingly, little attention is given to the fact that one careless act, through lack of discipline, may result in the loss of several lives, and days of idleness when the mine must be shut down.

Mine officials appear willing to take these chances, claiming that they have to relax the discipline of the mine, for a time, during the present scarcity of labor and the great demand for coal. They say this is necessary in order to keep the men they have and get others.

Glancing over a mine inspector's report recently, I noticed that the question was asked, "Does the foreman enforce rigid discipline?" This question was followed by an unfilled space. Upon my calling the inspector's attention to the item, he remarked, "Practically, there

is no discipline in many of the small mines, now. In order to get and keep men, discipline has been thrown to the four winds in many instances." In response to my statement that "Soon the accident rate will be increased in the mine," he replied, "That is already true, today."

No one will attempt to deny that the effect of suspending rules of safety, for any reason whatsoever, will be to destroy all order and system and increase the accident rate. To require a strict observance of mine rules today, and permit their violation tomorrow, as some mine officials are doing, is equivalent to having no rules at all.

NECESSITY OF ENFORCING SAFETY RULES

While miners are frequently a little stubborn, my experience is that most of them are willing to obey rules of safety where they are consistently enforced in the mine. But, they are quick to take advantage where there is any laxity observed in the enforcement of such rules. My observation leads me to believe that, in a number of instances, the foreman is more to blame than the miner, because of his slack and inconsistent methods. But almost without exception the blame for an accident is laid on the miner.

To illustrate this fact, let me assume that the superintendent is pushing the foreman for an increased daily tonnage. In turn the foreman urges the miners to load more coal and, to do this and assist the boss to the extent of his power, many a miner neglects a piece of bad top that should be timbered before he loads his coal.

The miner takes a chance and starts to load his coal but is caught by the fall of the loose piece before he has finished the car. It may be that the boss came into the man's place while he was loading and observed the danger, but said nothing except to express his satisfaction at the number of cars being loaded. I want to ask, Where would the blame for such an accident rest—on the miner or on his foreman?

JOHN ROSE,
Dayton, Tenn. Former District Mine Inspector.

The Handling of Men

Letter No. 6—To my mind, the efficient handling of men is an important factor in coal mining, especially under the present labor conditions. To be successful in getting the most out of men and keeping them satisfied and contented, a foreman must be a good student of human nature. In dealing with his men he must use tact and diplomacy.

The coal-mining industry employs workers from all quarters of the globe. In our mines are found English, Scotch, Welsh, Irish, French, Swede, German, Russian and Italian workmen. In a few instances Chinese coolies from the Far East and Mexicans from beyond the Rio Grande are employed. These representatives of different nationalities each possesses characteristics peculiar to his race and often presents a marked contrast with the qualities of the American miner.

To deal successfully with these men, the foreign miner must be treated largely from his own standpoint or way of thinking and acting. Many individuals of

the same nationality manifest certain traits peculiar to the section of the country from which they hail. Some may come from the north of England, others from the plains of Italy, and these present quite different characteristics. While the Englishman has a round-about method of dealing, the Italian has a more decisive way and requires being treated accordingly. All have their prejudices and moods. The man who presented no difficulty yesterday may seem to be quite impossible today.

The foreman is often compelled to deal with these men not as he ought to, in view of their acts, but as his judgment and tact will suggest. Agreement with opinions and tastes, in some possible respects, and the tactful changing of the subject when one cannot agree, will go far toward producing harmony and success. Patience is the mine foreman's greatest asset. To keep the confidence of these men the foreman must be absolutely genuine and sincere at all times. The successful foreman can never ride roughshod over his men. He must be human in his dealings with them. The methods of war have no place in a coal mine if the best results are to be obtained. Let every foreman study to please his men and he will find them more willing to please him and do his bidding.

Smithton, Penn.

ROBERT LITTLEHALES.

The Old Guard

Letter No. 1—A Foreword that appeared some time since in *Coal Age* [Vol. 12, p. 309] impressed me deeply at the time. It spoke of "recompensing loyalty" in faithful employees who, after a lifelong service of devotion to one company have been set aside for younger men, regardless of the fact that the experience and counsel of the older men are valuable assets in the economical and safe operation of the mine.

The truth conveyed in this Foreword, which might well have been entitled "The Old Guard," was forcibly brought home to me recently while shopping in one of the large department stores in a near-by city. In this store I observed two or more gray-haired men who had seen their 40 or 50 years of service and had probably been retired, only to be placed again in the harness owing to the urgent need when the war crisis had called younger men to the colors.

These members of "The Old Guard" were willingly doing their bit and serving beyond their time, as a loyal act to their employers. It occurred to me that the same loyalty to service would be displayed by more than one veteran in the mine service, and that their experience and knowledge of mining conditions would be valuable.

If "The Old Guard" render efficient service in the store, why is it not possible to secure the same efficiency by placing "The Old Guard" at the mines in positions where their mature judgment would be of service. The younger men can learn much from the experience of those who are older, and greater safety and economy would result. My suggestion, for the present emergency at least, is to put the "The Old Guard" back again in harness where they can render efficient service in work of which they are capable.

Berlin, Penn.

JOSEPH A. GRAVES.

INQUIRIES OF GENERAL INTEREST

Conformity in the Coal Measures

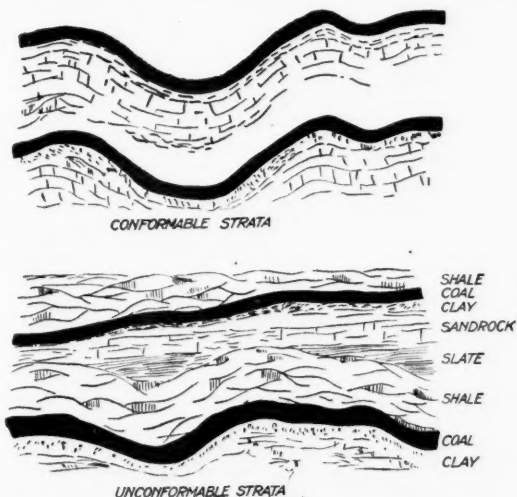
I desire to ask for information in regard to the general correspondence of local dips and rises in two seams of coal separated by from 40 to 80 ft. of intervening strata. For example, when a dip or rise is found in the working of a lower seam is it reasonable to expect that a corresponding dip or rise will be encountered, at the same point, in an overlying seam? Or, say where a well-defined basin exists in one seam, would it be expected that a similar basin would be found in another seam lying a considerable distance above the first?

I would like to hear from men who have had experience in working seams overlying or underlying others that have been previously worked, and who have observed in regard to the occurrence of similar elevations or depressions in both seams at the same point.

Clarion, Penn.

J. W. S.

Two seams lying in the same formation, although separated by 50 or 100 ft. more or less are very apt to present similar features at the same point in the seam. For example, as illustrated in the upper half of the accompanying figure, a general roll forming a syncline



IDEAL SECTIONS IN THE COAL MEASURES

or an anticline in the formation is very liable to affect both seams, but this is not always the case. As shown in the lower half of the same figure, it sometimes occurs that the intervening strata are unconformable between the two seams, in which case the configuration in the upper seam will not correspond to that in the lower seam.

The question of correspondence in the physical features in two seams, the one overlying the other, will depend on what has taken place between the time when the lower seam was deposited and that when the upper seam was laid down. There may have been a period of disturbance in the interim between the deposition of the two seams.

The disturbance may have elevated certain portions of the lower seam and depressed others, forming anticlines and synclines in the strata. Following this period of unrest, the upper seam is laid down on the disturbed formations, in which case its bedding would be practically level, where synclines and anticlines occur in the lower seam.

Again, during the period of the deposition of the two seams, there may have occurred a general elevation of the strata so as to form a land surface, and, before the laying down of the second seam, this surface may have been eroded by geological agencies such as wind, water, or ice, whereby a configuration results that is entirely distinct from that existing in the lower formations. Somewhat later, a sinking of the strata occurs and the upper seam is deposited over this area, which has been thus changed by erosion, and unconformity results.

It is evident that any disturbance occurring after the deposition of the two seams will affect both alike, and the same dips and rises that occur in the one seam will be found in the other. But, should such a disturbance occur during the period separating the deposition of the two seams, as has been described, the upper seam will not generally be found conformable in all respects, with the configuration of the lower seam.

The accompanying figure illustrates the two conditions, showing, respectively, conformity and unconformity in the strata enclosing two seams of coal. As previously stated, the former condition is the more common. Especially is this true throughout the bituminous coal fields, where there has been less faulting of the strata and violent disturbance that would give rise to unconformity.

We know that this question of the correspondence of dips and rises in two contiguous seams will meet with a hearty response from the many practical mining men who are interested in the Discussion department of *Coal Age*, and shall be glad to learn the results of their observations and experience.

Elevation of Outer Rail of Track

Can you give me a simple rule for ascertaining the proper elevation for the outer rail of a mine track?

Springfield, Ill.

MINE SURVEYOR.

Stretch a line, as a chord of an arc, on the inside or gage line of the outer rail of the track, allowing $17\frac{1}{2}$ in. in the length of the line, for each mile per hour in speed of hauling. The middle ordinate of this cord will be the required elevation of the outer rail. Thus, For a speed of 4 mi. per hr., length of chord is 5 ft. 10 in. For a speed of 6 mi. per hr., length of chord is 8 ft. 9 in. For a speed of 8 mi. per hr., length of chord is 11 ft. 8 in. For a speed of 10 mi. per hr., length of chord is 14 ft. 7 in.

EXAMINATION QUESTIONS

Utah Mine Foremen's Examination, Held at Price, Nov. 7, 8, 1917

(Selected Questions)

Ques.—If the total pressure upon a ventilating door is 400 lb. when the water gage is $2\frac{1}{2}$ in., what is the area of the opening; and what is the height of the door if its breadth is 5 ft. 6 in.?

Ans.—A water gage of $2\frac{1}{2}$ in. corresponds to a pressure of $2\frac{1}{2} \times 5.2 = 13$ lb. per sq.ft. The total pressure on the door being 400 lb., the area of the opening is $400 \div 13 = 30.77$ sq.ft. The breadth of the opening being $5\frac{1}{2}$ ft., its height is $30.77 \div 5.5 = 5.59$ or, say 5 ft. 7 in.

Ques.—Compare the perimeters and areas of the following airways: One airway is circular and 7 ft. in diameter; another 6 ft. by 5 ft. in section; and a third $5\frac{1}{2}$ ft. square. State which of these airways you would prefer, and find the velocities, in feet per minute, when an air current of 12,000 cu.ft. per min. is passing in each.

Ans.—The circular airway has a perimeter of $3.1416 \times 7 =$ say 22 ft. Its sectional area is $0.7854 \times 7^2 = 38.48$ sq.ft.

The perimeter of the rectangular airway is $2(6 + 5) = 22$ ft. Its sectional area is $6 \times 5 = 30$ sq.ft.

The perimeter of the square airway is $4 \times 5.5 = 22$ ft. Its sectional area is $5.5 \times 5.5 = 30.25$ sq.ft.

When passing 12,000 cu.ft. of air per min., the velocities in these several airways are as follows:

Velocity in the circular airway, $12,000 \div 38.48 = 311.85$ ft. per min.

Velocity in the rectangular airway, $12,000 \div 30 = 400$ ft. per min.

Velocity in the square airway, $12,000 \div 30.25 = 396.69$ ft. per min.

For the purposes of ventilation, the circular airway is preferred, because it gives the largest sectional area for the same rubbing surface; and it will therefore pass a large quantity of air for the same unit pressure, than either the rectangular or the square airway.

Ques.—What method of ventilation lessens the danger of an explosion and reduces friction?

Ans.—Splitting the air current in a mine reduces the danger of an explosion, by distributing the air to the different sections of the mine in proportion to their needs. At the same time, the velocity of the air current at the working face is reduced, with the result that less mine dust is carried in suspension in the air and the gases produced in each section are conducted at once to the return airway and carried out of the mine without passing into the other sections. In this system, a local explosion of gas or dust occurring in one section is not liable to be transmitted to another section of the mine.

Also, by dividing the air current into two or more splits, the same quantity of air is circulated at a less

velocity, which greatly reduces the friction of the air and lessens the power necessary to produce the circulation. While splitting the air current does not reduce the danger of a local explosion occurring in a working place, it does reduce the danger of that explosion being extended throughout the workings of the mine and producing a mine explosion.

Ques.—If 13 cu.ft. of air, at the ordinary temperature and pressure, weighs 1 lb., how many tons of air is passing through a mine in 8 hr., where the current measures 52,000 cu.ft. per min.?

Ans.—The weight of air passing through the mine in 8 hr., in this case, is

$$\frac{8 \times 60 \times 52,000}{13 \times 2000} = 960 \text{ tons}$$

Ques.—What should be done in case of accident to a ventilating fan or its driving machinery?

Ans.—Notify the men and withdraw them from the mine as quickly as possible. In the meantime, keep the fan going at a moderate rate, if possible, until all the men have reached the surface. Use every means to keep up the circulation of air in those sections of the mine where a longer time is required to withdraw the men. To do this, short-circuit the air in other sections where the men have been withdrawn.

In a large mine, where considerable time will be required before all the men can reach the surface, it may be possible to install a steam jet in the upcast shaft. Or, perhaps, a wind cowl can be constructed at the top of the downcast shaft, or at the mouth of the slope, to deflect the surface wind into the mine, where there is a strong prevailing wind on the surface. This work, however, must not interfere with efforts to get the men out of the mine as quickly as possible.

Ques.—A current of 3000 cu.ft. of air is at the explosive point; how much fresh air must be added so as not to get a cap on the safety lamp?

Ans.—Assuming that this air current is charged with gas to its maximum explosive point when it will contain 9.46 per cent. of gas, the quantity of gas in this current is then $3000 \times 0.0946 = 283.8$ cu.ft. per min. The lowest percentage of gas that can be detected on an ordinary safety lamp, as an unbonneted Davy lamp burning sperm or cottonseed oil, is 2 per cent., although some firebosses have difficulty to detect less than $2\frac{1}{2}$ per cent. of gas. Estimating on the lower percentage, the total volume of air and gas when a cap is just discernible on the lamp, would be, in this case, $283.8 \div 0.02 = 14,190$ cu.ft. per min. The quantity of air to be added to produce this result would then be $14,190 - 3000 = 11,190$ cu.ft. per min.

Again, taking 2.5 per cent. as the basis of estimate, the total volume of gas and air in circulation when a cap is first discovered on the lamp, would be $283.8 \div 2.5 = 11,352$ cu.ft. per min.; and the quantity of air to be added, in that case, would be $11,352 - 3000 = 8352$ cu.ft. per min.

COAL AND COKE NEWS

Harrisburg, Penn.

Reports that Governor Brumbaugh is considering the idea of an extra session of the Legislature have caused numerous suggestions as to legislation to be included in the call. It has been 12 years since an extra session was held, and one would cost about \$500,000 or more, according to its length. Among the suggestions made to the Governor are waterways for carrying coal and mine-cave legislation. Several delegations from the anthracite regions have called at the Governor's office during the past week, urging the Governor to include a remedy for the mine-cave evil in his call, should he decide to convene the Legislature.

Suggestions that the Fuel Administration fix a premium of about 10 per cent. for quality, in addition to the new price of \$3.05 for coal at the mines, was made on Feb. 20 by Representative Louis T. McFadden, representing the 14th Pennsylvania district in Congress. Mr. McFadden is quoted as saying:

"Now that the Fuel Administrator has fixed a price for coal at the mines of \$3.05 a ton, there should be added to the price he fixes a premium of about 10 per cent. for quality coupled with a condition that any producing company shipping coal of poor quality should be penalized for so doing. "This premium would be incentive to the operator to bring his coal to the highest possible standard. When he has so done the railroads would be relieved of carrying much of the refuse that is now being carried and which is of no use to the consumer when he gets it."

It is pointed out by operators in the central Pennsylvania district that under the new price ruling of Dr. Garfield, where the price of run-of-mine steam coal is set at \$3.05 net, there is no longer any extra allowance permitted on smithing coal. The rule now is that smithing coal must be sold at the price of prepared coal in the district where it originates, and as there is no prepared coal shipped from the central Pennsylvania steam-coal districts, the price of central Pennsylvania smithing is now \$3.05 net at the mine, or \$3.20 jobbing.

Coal operators in the Pittsburgh District have again taken up the question of higher prices per ton and are now working on a uniform system of cost sheets on which to base an application to Washington for a higher price. For the benefit of mines using electrical power, the matter of curtailing power from the West Penn Power Co. and other companies to less essential industries is under consideration.

Plans were outlined at a conference of fuel administrators from the central and western counties of this state on Feb. 23, to accelerate production and equitable distribution of bituminous coal for Pennsylvania industries. Many vital war industries are hampered by lack of bituminous. At the same time it was decided to begin a clean-coal campaign at the mines.

J. P. Cameron, bituminous distributor, addressed the conference. He told the fuel administrators that his office was compiling data of the capacity of the mines, points of distribution, and such other details of the coal industry as will enable him to arrange a plan of equitable car distribution, so that each mine will operate on the ratio of its capacity. At present many mines operate every day, while others in the same district only work one or two days each week. It was the unanimous opinion of the conference that the advance in the price of soft coal from \$2.45 to \$3.05 a ton has stimulated production, many mines having resumed operation after being closed for several months.

B. Leopold, county fuel administrator at Altoona, told the conference that during the coal crisis of several weeks ago the loyal support of the railroad officials and employees enabled him to supply fuel to homes and industries. This, he said, was in defense of the Pennsylvania Railroad and its employees. One of the developments of the conference was that more than 110,000 tons of coal are mined annually in the winter season by farmers,

who are agriculturists in the summer months and miners in the winter. These men refused to operate their small mines at the prices fixed by the Government.

With the price at \$3.05 a ton, hundreds of farmers have agreed to resume work in mines employing less than a dozen men. The fuel of the farmer-miners is used solely for domestic consumption. However, every such mine that is not producing throws a heavier burden on the large producers.

Millions of dollars worth of culm banks are disposed of by a decision of the Supreme Court in the equity proceedings of W. L. Kramer, of Pottsville, against John Slattery, of Port Carbon. By the decision independent coal companies which years ago deposited culm on lands now owned by big coal corporations still own the culm, even though the land on which it rests has changed hands.

Kramer asked the county court for an injunction against Slattery, an independent coal operator, to prevent the latter from using certain culm claimed by Kramer. The county court refused the injunction, but the Supreme Court orders a hearing, after stating the law, and places the costs on Slattery. G. T. O'Donnell & Co., of Philadelphia, who claimed possession of the big culm banks at Loyalton, did not press their contention when the case was called in court on Feb. 23, the announcement being made that the case was discontinued. This leaves the big culm banks in possession of T. D. Bergen, of Pottsville. It was asserted by the Philadelphia concern that they had made arrangements to buy the banks from Bergen for \$150,000 and that the check for the first payment was handed over. Bergen, however, asserted that the check was never cashed and the preliminary agreements were not carried out.

PENNSYLVANIA

Anthracite

Mahanoy City—A committee of 70 representative citizens has decided to build a hospital here for injured miners. An organization has been effected with Councilman John Adams as president and D. Hiram Morgan as secretary.

Shamokin—Every colliery in the Shamokin-Mount Carmel district was in operation on Feb. 22, the first time in history that the miners worked on Washington's birthday. Record production was reported by company officials. Foremen met the men at the shafts and slopes as they left the mines and thanked them for their patriotism.

Seranton—Following the announcement on Feb. 20 that the Government had fixed standards for the anthracite coal operators, and expected that in the future every colliery in Lackawanna County would turn out a cleaner and better grade of coal, Tudor R. Williams, fuel administrator, has ordered six breakers closed until such time as they can at least approximate those standards. Mr. Williams has stated that three or four others now being investigated will be closed unless changes in their methods of preparation are made. He would not divulge the names of the operators who had felt the strong arm of the Government, because, he said, he hoped they would make immediate effort to obey the law.

Notice has been served on St. John's Catholic Church, by the Delaware, Lackawanna & Western R.R., Coal Department, that it will soon begin mining operations under the edifice and that if the congregation desires to purchase the pillars as a means of safeguarding the property it should act immediately. The entire property is valued at \$250,000.

Kaska—The Kaska colliery of the Alliance Coal Mining Co. will be reopened this spring and will be operated with Harwood power furnished by the Lehigh Coal and Navigation Electric Co. This colliery was closed down some years ago when a disagreement between the railroads made it hard to get a car supply.

Zehner—The East Point Coal Co., operator of the Pound Creek mines near here, is without a breaker and is sending run-of-mine coal to market.

Jeddo—The G. B. Markle Co. is erecting a steel washery at its No. 4 breaker, which

will increase the output about 500 tons daily.

Ashland—The reclamation of the old Bickel colliery at Lavelle, near here, abandoned more than 20 years ago, began Mar. 1, when the Laurel Hill Coal Mining Co., controlled by Wilkes-Barre capital, put into operation its big breaker, the most modernly equipped in this end of the anthracite region. The breaker has been erected at a cost of \$100,000. The reopening of the long abandoned colliery is to be followed by the reclamation of other abandoned mines in which there remain hundreds of thousands of tons of coal in supporting pillars and in the underlying veins.

Audenberg—The Lehigh Valley Coal Co. has purchased outright about 260 acres of coal land from the New York & Lehigh Coal Co. The purchase was effective Jan. 1 and anticipates the expiration of a lease in April, 1918, which the Lehigh Valley Coal Co. bought from George H. Meyers & Co. in 1892, and under which it has been mining coal in the tract since that time. The coal mined from the tract is taken to the Spring Mountain breaker at Jeanesville for preparation.

Bituminous

Indian Head—The properties of the Indian Creek Collieries Co., controlled by Vernon F. Taylor, of Indiana, has been sold to Pittsburgh capitalists. The property includes 800 acres of coal land, 20 miners' houses, the Indian Creek mine and other buildings connected with it. The new company has started improvements on the property and is installing a modern electric plant. The consideration was not made known.

Vintondale—The floods during the past week closed several of the mines along Black Lick Creek. In most cases the mines are on the north side of the creek while the towns are built on the south side. During the night several of the bridges connecting the mines and the towns were washed away and the mines were idle for a few days because no men could get over the creek to their work. Temporary bridges were soon constructed and in a few days the mines were working full capacity.

Pittsburgh—The annual meeting of the mine foremen and firebosses examining boards for the various bituminous districts of Pennsylvania has been called for Friday, Mar. 8, at the Seventh Avenue Hotel, Pittsburgh. The meeting will be attended by about 100 of the leading mining men of Western Pennsylvania.

Dubois—William Black, a Luthersburg miner, is in the local hospital for treatment of horrible burns about the head, face and especially the eyes, caused by the explosion of a carbide light. Mr. Black touched a light in his lamp and the gas exploded in his face. It is feared that his sight may be permanently destroyed.

WEST VIRGINIA

Charleston—The Wolf Den Coal Co., with a mine at Shallmar, on the line of the Western Maryland R.R., expects to ship coal some time in March. Due to delay in receiving equipment development work had been held up.

Horner—The Stone Coal Co. is now shipping from its new mine near here.

Accoville—The operation of the United States Block Coal Co., located on Coal River, have been taken over by the Carbon Hill Collieries Co.

Mullens—The Norfolk & Western Ry. has been ordered by the West Virginia Public Service Commission to extend a spur track to the Trace Fork Coal Co.'s mine at Trace Fork. The coal company has to pay for putting in the siding and maintaining it.

Bluefield—The commissary of the Pocahontas Fuel Co. at Switchback was burned recently. The building was totally destroyed, and the loss is estimated at \$25,000. A short-circuit is said to be responsible for the blaze. This is the second time this company's store and stock has been burned. The company is confronted with a problem, as there is no building at Switchback large enough to store the goods necessary to supply the miners. A modern brick store-and-office building is under construction.

Tunnelton—The Car-Diff Smokeless Coal Co., which has been developing a mine in the Upper Freeport vein of coal on a tract of about 800 acres, acquired a few months ago by it at West End, near Tunnelton, Preston County, West Virginia, is now ready to ship coal. The company expects to start shipping about 300 tons a day and increase as development increases. The plant is on the Baltimore & Ohio R.R. at the west end of the Tunnelton tunnel.

ILLINOIS

Virden—Twenty-eight cases of powder exploded at the Royal colliery here on Feb. 22. Four men were killed.

Marissa—W. F. McMurdo of Marissa, E. F. Winkler, of Belleville, August G. Koesterer of Freeburg and George Wombacher of Mascoutah have been named as a committee to issue licenses to mine owners and superintendents for the use of explosives and have begun issuing them.

Witt—Fourteen suits brought by local property owners against the Peabody Coal Co. for damages caused by the settling of the surface of the ground when the company removed the props from the Witt mine have been settled by the payment of \$4000 by the company to the plaintiffs, who divided it according to the amount of damage each had sustained.

Troy—The Donk Brothers Coal and Coke Co. is experimenting with storage battery motors in its No. 3 mine here. They are intended to take the place of mules in the gathering of cars from the rooms.

Edwardsville—Prospecting is being done on a tract of about 12,000 acres in Pin Oak and Edwardsville townships, preliminary to important development work. It is understood that at least four shafts will be sunk. The tract is convenient to the Illinois Central in the vicinity of Mont and Kuhn Station, the Clover Leaf east of Edwardsville and the belt line south of Edwardsville. Circuit Judge William P. Early is interested in the enterprise.

Chatham—The new Solomon coal mine will be opened soon. It is estimated to produce from 3000 to 5000 tons of coal a day when mined to full capacity. A seam of coal 7 ft. thick is available. From 500 to 600 men will be employed.

Lincoln—The mine of the Lincoln Mining Co. will be wrecked and business suspended, as announced two weeks ago. An effort was made by business interests of Lincoln to save the mine for the benefit of the city's growth and development as an industrial center, but it was found that the expenses of checking the fire raging in the mine would exceed the profits of the company. Accordingly, the work of razing the mine buildings and of sealing the shaft, after a temporary delay during which it was hoped to save the industry, were continued.

Springfield—Four miners were killed in an explosion in a mine of the Citizens Coal Company. The dead are Ray Hiner, Henry W. Heichel, Thomas Reilley and Ernest Cox. All four of the men were shot-firers and were buried in the explosion. It is not known what caused the explosion. But little damage was done to the property of the mine.

Springfield—Evan D. Jonn, state director of mines and minerals, has announced the following itinerary of the Miners' Examining Board for March as follows: Duquoin, Mar. 7; Christopher, 8; Harrisburg, 9; West Frankfort, 11; Herrin, 12; Belleville, 14; Collinsville, 15; Litchfield, 16; Springfield, 19; Pana, 20; Danville, 21; LaSalle, 23; Peoria, 25; and Canton, 25.

Virden—Four men were killed by a powder explosion in the Royal Colliery mine here when 28 kegs of powder exploded. It was being hauled in the mine on a car and it is understood that it became ignited either from an overheated journal or some similar cause.

Springfield—Four shotfirers were killed in an explosion in the Citizen's Coal Co. mine here on Feb. 23, in the early morning hours. They were buried beneath the wreckage. Three others in the mine escaped. The property damage was small. The cause of the accident is unknown.

INDIANA

Terre Haute—Fire recently destroyed a \$30,000 tippie and mining machinery of the Jackson Hill Coal and Coke Co. Manager J. C. Kolsom reports that the company will rebuild at once, and that its output has been lowered 2000 tons a day as a result of the fire.

Linton—The Greene Valley Coal Co. has changed its principal place of business from Terre Haute to Linton.

KENTUCKY

Pineville—A runaway of 37 mine cars at the Elliott branch mine of the Federal Coal Co., at Pineville, Ky., resulted in the wrecking of a number of cars, spilling of coal all about the tippie, and damage to the tippie to such an extent that it became necessary to shut down the mine for several days.

UTAH

Hiawatha—The Black Hawk mine of the United States Fuel Co. produced Feb. 1 what is believed to be a record breaking tonnage for the Rocky Mountain district. On that day 3358 tons of coal were loaded into 60 new cars of the Utah Railway Co., there being an average of 112,000 lb. or 56 tons to each car. During the month of January the mine produced over 50,000 tons of coal, an unusually high record for Utah.

Foreign News

Sydney, Australia—The government of New South Wales has agreed to supply the States of Victoria, South Australia and West Australia with all the coal they need for a period of five years. The New South Wales Government intends to nationalize all the coal mines in the state.

Personals

Loyall A. Osborne, of New York, vice president of the Westinghouse Electric and Manufacturing Co., and chairman of the executive committee of the National Industrial Conference Board, has been appointed, by the Secretary of Labor, a member of a



LOYALL A. OSBORNE

committee on industrial peace during the war. This committee, which consists of five representatives of employers, five labor leaders and two public men, will provide a definite labor program in order that there may be industrial peace during the war, thus preventing interruption of industrial production vital to the war.

George Carter, formerly chief coal inspector for the G. B. Markle Co., of Jeddo, Penn., has been appointed Federal Coal Inspector for the lower end of Luzerne County, Pennsylvania.

J. B. Hart, president of the Hartland Colliery Co., of Clay, W. Va., is temporarily managing the affairs of the company since the death of M. McDonald Price, who was general manager of the company's mines in Coal & Coke R.R. territory.

W. H. Thompson, for many years prominent in the heavy electric traction work of the Westinghouse Electric and Manufacturing Co., has resigned to accept the position of works manager of the Fairmont Mining Machinery Co., of Fairmont, W. Va., makers of coal-mining equipment.

Charles M. Means, consulting mining engineer, with offices in the Oliver Building, Pittsburgh, Penn., has opened a New York office at 90 West St. Mr. Means, who is well known to the coal-mining industry, has delegated all office work to a member of his staff, and spends most of his time in the Pittsburgh office.

F. O. McGuinness, for some time northern sales manager of the Bader Coal Co., and manager of the Buffalo office of the company, has resigned to become the purchasing agent of several coal-consuming concerns, with office in Buffalo. In consequence of the resignation the office of the Bader Co. will be closed.

Douglas Bunting, mining engineer for the Lehigh and Wilkes-Barre Coal Co., Wyoming Division, will succeed General Superintendent Newbaker when the latter leaves for his new post with the Berwind White Co., on Mar. 1. **Arthur Lewis**, now with the G. B. Markle Co., at Jeddo, will take the position vacated by Mr. Bunting.

E. J. Newbaker, division superintendent of the Lehigh & Wilkes-Barre Coal Co., Wyoming Division, Wilkes-Barre, Penn., has resigned his position, effective Feb. 28. After Mar. 1, he will be associated with the Berwind-White Coal Mining Co., and will have headquarters in their offices, in the Commercial Trust Building, Philadelphia.

Thomas Haulton, of Pittsburgh, Penn., chief electrician and master mechanic for the United Coal Corporation and subsidiary companies, has resigned, effective Mar. 1, to accept a similar position with the George M. Jones interests in Ohio, with headquarters in Toledo. Mr. Haulton will be succeeded by his assistant, **James A. Malady**, of Elizabeth, Penn.

Henry G. Davis, of Kingston, Penn., formerly identified with the mining department of the Lackawanna Coal Co., has been named superintendent of the Wilkes-Barre division of the Lehigh & Wilkes-Barre Coal Co.'s collieries. The appointment was announced by C. F. Huber, president of the company, at a banquet tendered in honor of E. J. Newbaker, who recently resigned. Mr. Davis left the Lackawanna company's employ on Feb. 21.

Obituary

Elias Phillips, for many years a state mine inspector in central Pennsylvania, died Feb. 21 as he was entering the Adams Express office at his home in Dubois, Penn. He was in apparent good health to the moment of his death, and his decease from acute dilation of the heart was a severe shock to the community. Mr. Phillips at the time of his death was 58 years of age. He leaves a widow, three brothers and two sisters. His inspection district was known as the 4th Bituminous, and covered parts of Clearfield, Jefferson, Clarion and Clinton and all Elk and Cameron counties. Mr. Phillips was a practical miner, having swung a pick in his earlier years. In later years he had by frugality and good judgment become possessed of a comfortable competency.

George W. Theiss, president of the Theiss-Bygate Co., large coal operators of Pittsburgh, Penn., died Feb. 22, at the Eye and Ear Hospital shortly after he had taken a stroke on a street car while bound for his office. Mr. Theiss had been in the coal business in Pittsburgh since 1888 and was identified with several large operating companies there. He was a former vice president and director of the Monongahela River Consolidated Coal and Coke Co. and a director of the Pittsburgh Coal Co. He was also a director of the Duquesne National Bank. He is survived by his wife and one son.

John B. Hamilton, formerly a resident of Columbus, Ohio, who was prominent in coal mining circles, died at Los Angeles, Cal., recently at the age of 84 years. He was born in Scotland and came to America when four years old. He was the organizer of several mining ventures in the Buckeye State.

John F. Hunter, general manager of the Clover Bar Coal Co., Ltd., Edmonton, Alta., died suddenly of heart failure on Feb. 16 at the age of 45. He came from Winnipeg to Edmonton in 1910, where he engaged in the coal business and was one of the largest shareholders of the Clover Bar Coal Co. He leaves a widow.

Col. Reese A. Phillips, aged 55 years, former general manager of the Delaware, Lackawanna & Western R.R., Coal Department, died at his home in Scranton, Penn.

on Feb. 22. Colonel Phillips started with the company as a breaker boy, and gradually advanced until he became general manager of the mining department. He directed the interests of the company until a few years ago.

Industrial News

Washington, D. C.—The executive committee of the International Railway Fuel Association has offered the services of the association to the conservative division of the fuel administration for such use as can be made of them.

Youngstown, Ohio—President S. Kerr, of the Sharon Steel Hook Co. announces that the construction of an additional blast furnace, a byproduct coke oven plant and houses for workmen are contemplated, but no definite action has been taken by the company.

Lexington, Ky.—The Garey Coal Co., 144 Short St., Lexington, recently organized by W. M. Hayes, C. E. Duff, J. T. Garey and others, to install a coal mine at Chavies, Ky., will receive bids in April for machinery for an open type of mine; daily capacity, about five cars.

East Pittsburgh, Penn.—The Westinghouse Electric and Manufacturing Co. announces the removal of its office from Phoenix, Ariz. to Tucson, Ariz. Its representatives, J. H. Knost and W. G. Willson, will have headquarters in the Immigration Building at the latter point.

Birmingham, Ala.—Operations have begun at the new shaft mine of the Birmingham-Tuscaloosa Coal Co., at Shiras, in the Blue Creek field, about 30 miles from Birmingham. The opening is on the Louisville & Nashville Railroad, and work has been in progress since last November.

St. Louis, Mo.—Five assistants to H. N. Taylor, fuel administrator for St. Louis, have been appointed by Federal Fuel Administrator Garfield. They are D. F. Cushing, Des Moines, Iowa; Charles Markham, Kansas City, Mo.; J. G. Puterbaugh, McAlester, Okla.; J. W. Hinton, Ada, Okla., and W. H. John, Bridgeport, Texas.

Columbus, Ohio—The Reliable Coal and Supply Co. is the name of a new retail concern located at West Broad St. and the Hocking Valley tracks. J. W. Bresnahan, formerly with the West Virginia Coal and Coke Co., is in charge as secretary and treasurer. Carl M. Deardorf is president. The authorized capital is \$15,000.

Columbus, Ohio—The Hocking Valley Ry. Co. has been allotted about a dozen locomotives which were manufactured for Russian delivery. These locomotives are now in the railroad shops having finishing touches put on before being put into service. They will increase the efficiency of the road's motive power to a large degree.

Charleston, W. Va.—Government engineers are listening to the river coal men and boat men in considering plans for new locks and dams in the Ohio and Monongahela Rivers, as it is being urged that new locks should be made at least 700 ft. long, so that they can take through a complete coal tow without breaking it up.

St. Louis, Mo.—A judgment for \$6000 has been given in the St. Clair County Circuit Court against the St. Louis & Fallou Coal Co. in favor of Mrs. Margaret Eichhorn, of Belleville, for the death of her husband, Louis Eichhorn, in the so-called "Nigger Hollow" mine. She sued for \$10,000. The company has filed notice of appeal.

St. Louis, Mo.—The Western Fuel Distributors Association, consisting of 26 jobbing concerns in St. Louis, which has been in existence since last summer, decided to disband this week in view of the fact that the jobbers' commission has been eliminated by Dr. Garfield. There were about 10 jobbing concerns in St. Louis, with a capital of about one-half million dollars invested.

St. Louis, Mo.—The ten municipal coal stations, which have been in operation since early in December, from which coal has been distributed to the poor at 16c. a bushel, were closed Mar. 1. The experiment is regarded as a success and the Board of Estimate and Apportionment has been asked to include in next year's budget an appropriation of \$25,000 for the coal station next winter.

Indiana, Penn.—According to the annual report of State Mine Inspector Thomas S. Bowther, for the year 1917, there were 5,818,138 tons of coal produced with a total number of 5777 persons employed.

There were 21 fatal accidents or a production of 277,054 per fatal accident. There were 11 new mines opened and an increase in production of 577,016 tons. The district comprises about one half of Indiana County.

Columbus, Ohio—Vigorous objection to lake shipment priority orders was made by county fuel administrators at the meeting held with Homer H. Johnson, Ohio Fuel Administrator in Columbus last week. A resolution protesting against any such orders, unless provision is first made to supply Ohio consumers with coal, was adopted. The national fuel administration at Washington will be advised of the action taken.

St. Louis, Mo.—The City Plan Committee of East St. Louis has recommended that the city grant to the Polar Wave Ice and Fuel Co. a permit to develop as a coal terminal 3½ blocks of property recently purchased by the company near the east approach to the Municipal free bridge. The plan is to install large concrete coal bumpers, sheds and tracks, from which to serve the business section of St. Louis with motor delivery.

Sedalia, Mo.—The coal dealers of this city have petitioned State Administrator Crossley that the Missouri zone to which Illinois coal is to be distributed be extended to include Pettis County. The western boundary of the zone is now just west of Jefferson City. Normally about 75 per cent. of the coal consumed in Pettis County comes from Illinois, and the dealers declare the supply from other sources is inadequate.

St. Louis, Mo.—The Coal Service Bureau is preparing to launch a "buy-early" campaign. Posters and literature will soon be issued urging householders to purchase their next winter's supply of fuel during the early spring and summer. State Administrator Crossley has given assurance that all the energies of the administration will be lent to the campaign and the St. Louis Fuel Committee will appoint a committee to cooperate.

Frankfort, Ky.—The Kentucky Railroad Commission has heard the protests of the Paducah Board of Trade, Mayfield and Fulton, Ky., relative to the increase in rates on western Kentucky steam and domestic coal. Steam coal was recently increased from 60 to 90c. a ton, and the railroads are endeavoring to increase the rate on domestic coal from 80 to 90c. a ton. The hearing was at the Paducah Board of Trade rooms.

East Pittsburgh, Penn.—The Westinghouse Electric and Manufacturing Co., has recently secured the exclusive sales agency for the United States for Frankel solderless connectors, widely used for joining electrical wires and cables. Manufacturing facilities have been increased by the Frankel Connector Co., in order to care for the new business to be secured through the Westinghouse sales organization. The Westinghouse company will act also as a distributor of Frankel testing clips.

Jefferson City, Mo.—Every town and city in Stone County, Missouri, will be "off" of coal next winter. Dr. C. D. Craig, administrator for the county, has notified State Administrator Crossley that the entire county is pledged to wood until the war is over. There is an abundant supply of wood in the county and wood-chopping bees will be held during the summer. Dr. Craig says that by next fall the woodsheds of the county will have enough stovewood piled up in them to do for the winter.

St. Louis, Mo.—P. H. Greenlaw, Secretary of the Fifth and Ninth Districts Coal Bureau, has been appointed distributor for those districts, which supply most of the fuel needs of St. Louis. He will be in direct charge of the output of the two districts under the supervision of Dr. H. G. Honnald, of Chicago, fuel distributor for Illinois. Missouri Fuel Administrator Crossley and the St. Louis Fuel Committee have contended that the distribution from the Fifth and Ninth districts should be in the hands of a St. Louis man.

St. Louis, Mo.—St. Louis coal jobbers met Thursday, Feb. 21, and voted to dissolve their organization, the Western Fuel Distributors' Association, because of the order of Fuel Administrator Garfield abolishing the profit of 15c. a ton which they have been receiving since the Government fixed the prices. A suggestion that the organization join with the national organization in fighting the order was vetoed on account of the expense that would be

involved. St. Louis jobbers expect to be forced out of business unless the order is rescinded or modified.

Hazard, Ky.—Due to the freight-car shortage, over 75,000 tons of coal which could have been shipped out last week was held up, according to a report of District Fuel Administrator A. R. Hord, who stated that the report of the week showed that the companies of the Hazard field were able to fill approximately 470 cars, while only 208 cars were received on average days. About 44 per cent. of the amount that could be shipped was actually moved. Mr. Hord stated that it was not a real shortage of cars, but a shortage of cars at the mines, due to the inability of the railroads to move the coal.

Rockdale, Texas—Henry G. Butler & Sons, of Hillsboro, Texas, have purchased 1238 acres of lignite lands near Rockdale, in Milam County, and will soon begin mining operations there on a large scale. The land purchased lies about 9 miles southwest of Rockdale and has long been recognized as virgin lignite fields, heavy veins having been found as near as 25 ft. of the surface. Of the land purchased, \$30,000 was paid for a tract of 629 acres and \$24,000 for another adjoining tract of 609 acres, giving 1238 acres in one solid block. Announced plans of the Hillsboro firm contemplate building a railroad from the nearest point on the International and Great Northern R.R., a distance of about 5 miles, and installing large steam shovels for stripping purposes.

Milwaukee, Wis.—To insure service and every possible assistance to the various departments of the U. S. Government in Washington, D. C., the Cutler-Hammer Manufacturing Co. has arranged to locate H. W. Knowles, of their New York office, permanently in Washington for the period of the war. Mr. Knowles entered the service of the Cutler-Hammer Manufacturing Co. shortly after graduating from Cornell University in 1912. He spent nearly five years in the shop, engineering department and sales department at Milwaukee. Since May of last year he has been connected with the New York district office, Hudson Terminal Building. The Washington Cutler-Hammer branch will have its headquarters at The Bradford, corner 18th and K Sts., telephone, Main 8426.

Cincinnati, Ohio—Members of the Cincinnati branch of the National Coal Jobbers' Association met at the Hotel Sinton on Feb. 21 to consider what action should be taken by them in connection with the plan of the Fuel Administration, as reported, to eliminate the jobbers' profit and, therefore, the jobber. The elimination of the permitted 15c. profit now allowed jobbers would force the operators to sell direct to large consumers, and to leave small consumers to their own devices, in the opinion of Cincinnati jobbers, thus causing considerable distress by leaving small consumers without means of getting coal. Fred Legg, of the Logan and Kanawha Coal Co., presided as president of the Cincinnati jobbers. A telegraphic protest was sent to Washington, and the jobbers will await the result of conferences which have been held with Fuel Administrator Garfield.

Cincinnati, Ohio—The stimulus given by Washington to the cause of water transportation has been felt more directly in the Ohio Valley, perhaps, than anywhere else in the country, and action looking to more extensive use of the river, especially in coal transportation, is being planned by several organizations, notably the Ohio River Improvement Association and the Chambers of Commerce of the several principal cities along the river. A company with a capital stock of \$600,000, with a fair return on the investment to be guaranteed by the Federal Government, has been proposed, and another plan contemplates Federal control of such a company. All interests agree that Federal support is necessary for the success of a venture large enough to handle traffic on a large scale, and to compel railroad cooperation, lack of which has been one of the chief causes of the decline of river traffic during the past generation.

Cincinnati, Ohio—The United States Circuit Court of Appeals, after hearing the arguments of all interests involved, is considering an application of the Central Trust Co., of New York, trustee of the bonds of the Continental and of the Kanawha & Hocking Coal and Coke companies, for instructions from the court as to the proper manner of making collection from the Hocking Valley Railway Co. of judgments against that company obtained by the New York Central Railroad Co., owner of the bonds, aggregating \$2,500,000.

MARKET DEPARTMENT

Weekly Review

This Winter's Coal Troubles Almost Over—Transportation Improved, Though Cars Are Still Short at Mine—Trade Awaits Announcement of New Prices

ASURE sign that fuel troubles are almost over for the present is evidenced by the fact that the country as a whole is now laying plans for next season's requirements instead of worrying about immediate needs. Even the situation in New England shows signs of improvement, better weather having enabled the movement of more coal from the southern tidewater ports via all-rail and Long Island Sound. Beyond Portland, however, the ports are still closed by ice. The shortage of vessels also continues to be a deterrent.

Though transportation conditions in general show marked signs of betterment, much of the freight congestion

having been cleared away, there are still well-founded complaints of a shortage of empty cars at the mines.

Receipts of anthracite at tidewater are more plentiful; but the demands for this, as well as for any grade of coal, are still strong. Bituminous coal is extremely short. The output in January was the lowest for any month since September, 1914, owing to inadequate car supply and railroad congestion. "Give us more cars, and we'll flood the country with soft coal," say the bituminous operators; and statistics show that they can do it.

Prices for the most part are based on contracts entered into before the

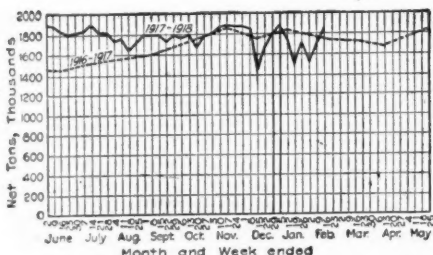
Federal price regulations went into effect, and there is little, if any, spot coal offered. No new contracts are reported, the trade evidently waiting for the announcement of the new price schedule promised before Apr. 1.

The anticipated elimination of the jobbers' commission has caused much criticism, as it is considered that this branch of the trade performs an important function.

Great care is still necessary in distribution and consumption, as no large reserve stocks of coal exist. Bunkers and bins were scraped bare during the past three months, and coal will neither be cheap nor plentiful this year.

COAL PRODUCTION

Production returned almost to normal during the week ended Feb. 16. The total bituminous output, including lignite and coal made into coke, is estimated at 11,084,000 net tons, nearly a million tons greater than in the preceding week. The average production per working day was 1,847,000 tons, as compared with 1,753,000 tons, the daily average for February of last year. The performance per working



day was better than at any time since early December, except during New Year's week. Indeed, because New Year's week contained but five working days, last week's total production exceeded that in any week since Dec. 8. Beehive coke shared in the recovery experienced by the bituminous industry as a whole. The total production for the week is estimated at 557,000 net tons, an average per working day of 93,000 tons.

CARLOADS OF COAL AND COKE ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

WEEK ENDED:

	Jan. 26	Feb. 2	Feb. 9	Feb. 16
Bituminous shipments, 121 roads...	181,471	170,552	181,586*	199,136†
Anthracite shipments, 9 roads...	33,406	34,482	32,011*	35,486†
Beehive coke shipments, 4 roads...	10,408	9,655	10,470*	11,425†

*Revised from last report. † Subject to revision.

Atlantic Seaboard

BOSTON

Situation less acute and Monday holidays discontinued. Naval collier turned over to Fuel Administration opens gate to manufacturers for limited supplies. Large tonnage still being distributed for domestic

use. Army quartermaster's department helps secure ships for New England. Receipts by water gradually increase, but far behind requirements. Railroads still on narrow margins and large textile and other plants are able only to get coal for a few days at a time. Panama R.R. colliers to stay in coastwise service for the present. Rail shipments very disappointing. Several mines previously shipping on "New England order" are having output diverted on Government requisitions. Outlook not very hopeful for spring shipments unless more bottoms are secured.

Bituminous—"Blue Mondays" are given up and those industrials having coal on hand have resumed operations on a normal basis. Many of the very small plants have been able to get fuel for a week or two ahead, but the larger the plant the more difficult it is to be assured a continuing supply. Mills burning 1 to 3000 tons weekly are patching along from day to day with the liberal use of culm and other substitutes, but unless arrivals show material increase there will be small chance of steady operation. What hope there is lies with the different departments at Washington, where officials are enough interested in the output of various New England plants to bring pressure to bear upon the authorities who have the disposition of ships. It is impossible to get sufficient supply all-rail under present conditions. Cars are taking six weeks to reach destination from the mines in many cases and all hope of early relief in that direction has long since been given up. It is fair to say, however, that the general situation is less acute, due largely to the mild weather and partly to somewhat better receipts of water coal. In Boston, deliveries have been resumed to all steam users, although in Portland, Maine, Springfield and Worcester, Mass., there is still great anxiety over the immediate future. The quantity of bituminous available for retail distribution is small, although domestic requirements have priority over practically everything but railroads. Local fuel committees vary in their handling of the problem, but all of them will go to most any lengths before permitting a factory to shut down at the expense of hundreds of operatives.

The naval collier "Jason," 10,500 tons, turned over to the New England Fuel Administration, by Secretary Daniels, for one trip, was a boon to manufacturers who are working on Government contracts. Practically half the cargo was distributed to munition plants and others rated 80 to 100 per cent. on army or navy requisition and centers like Lowell and Lawrence were spared a period of enforced idleness. Sev-

eral mills elsewhere were closed until this supply reached them, and almost the entire balance was used to help the Boston & Maine R.R. in operation. This one cargo accomplished a great deal of good, coal being sent from it as far as Rockland and Newport, Maine, and to St. Albans, Vt. The eagerness with which applications were received showed that consumers all over New England were but waiting for the slightest sign of encouragement to make their demands heard. The fact that the fuel authorities are actually distributing on a comprehensive scale is leading many to conclude that a large volume of coal is likely to be handled in this way for several months to come and consumers of all kinds are anxious to get their names on the "emergency list." So long as receipts continue on the basis of last week, there will be enough to keep a large proportion of the "essential industries" at least in partial operation.

Retail dealers are unable to supply the demand for bituminous for household use. Should this continue it will have a material bearing upon the situation. People are finding out that even the high volatiles can be used and until some encouraging program of anthracite distribution is adopted, there will be many who will try to secure soft coal while it can be had. It is being made plain that New England's supply is dependent more than anything else upon ships, and the appearance of any surplus of bituminous in dealers' yards will be the signal, it is believed, for active buying on the part of the average householder.

The war department, through the quartermaster-general and its interest in the output of New England mills, is a most powerful factor in getting coal for this territory. Officials at Washington are now somewhat impressed with the slogan, "No coal, no supplies"; and within a few days the shipping control committee has put at Mr. Storow's disposal the "Proteus," 11,000 tons, the "San Francisco," 8300 tons, and the "Angasea," 4300 tons, all available for prompt loading. At best, however, these ships can hardly make more than three trips a month, if that, and the tonnage thereby added is only a help. Several more moves of the same order are necessary to keep industries here up to normal efficiency.

To Feb. 16 receipts since Jan. 1 aggregated only 739,000 tons, while current needs are at least 2,000,000 tons a month. At this rate the individual reserves which have kept many plants running will soon melt away. A railroad which has always considered it unsafe to have on hand less than 60 days' supply in winter is now dependent upon emergency deliveries through the Fuel Administration.

At the same time receipts here have gradually increased beyond the January figures; the difference is that consumers in general have far less on hand. Every week sees a larger number of manufacturers and utilities joining in the demand for current supply.

If the delegations of labor men and textile manufacturers accomplished nothing else at Washington they secured a promise that the Panama R.R. colliers would continue in the coastwise service. Two of them will bring 25,000 tons every week, or approximately 100,000 tons monthly. While that is not an overwhelming supply its regularity is a real factor. It enables distributors to spread the coal over a wider area and therefore serve the greatest possible number of cases. Could there be several more such units the problem would be simpler.

Rail movement is not improving to the extent relied upon. The long hauls to which a large proportion of cars for New England is subjected have a bearing on the number allowed to come in this direction. As Government needs become more urgent, because of other mines falling in arrears, operations hitherto passed over by the authorities are now receiving their full share of department requisitions. This is particularly true of mines designated to ship to New England on the Garfield-McAdoo orders of Jan. 3, and it is true that mines called upon to ship a percentage of foreign railroad fuel now have that percentage increased. The net result is reduced shipments all-rail for consumers not railroads or directly concerned in war activities.

The wholesale trade is in a helpless state. The standing of the "jobber" is apparently subject to later developments and to what extent the "zoning system" is to be adopted remains undetermined. No program of distribution is outlined and a new "season" is supposed to open a month hence. Nothing has been heard about contracts the past week, there being a decided lull in that respect. For all the eager inquirers there is no answer at this writing.

L. A. Sneed, of the U. S. Fuel Administration, visited Boston last week on his country-wide tour of investigation. He explained his errand to the press and stated his belief that a rational system of distribution would soon be in effect.

Anthracite—Domestic sizes are very scarce and even the retailers in most favorable position are without anything like a continuous supply. A large volume of silt and other classifications of "anthracite" help swell the tonnage, but are of advantage only to steam plants that are especially equipped to burn this kind of fuel in connection with bituminous. Shipments coastwise are also intermittent, loading at Philadelphia and New York being hampered by light receipts.

NEW YORK

Local situation shows improvement. Jobbers up in arms against Garfield's proposed order eliminating them. Strong opposition develops and consumers enter the fight. Plans considered for preventing a repetition of this winter's shortage. Car supply improves.

Anthracite—The local situation has been enlivened this week by a number of conferences concerning the future of the coal business in this city, some reports of civic and business organizations and the beginning of the Board of Aldermen's inquiry looking to future prevention of a coal famine such as existed in this city this winter. In addition one of the Brooklyn retail dealers has submitted a plan whereby a consumer can be prevented from hoarding coal; in other words, it is a plan for proper distribution of coal.

A week of moderate weather has resulted in a slight improvement in the anthracite situation. Demand has not been as urgent, but dealers find a waiting market for all the supplies they can get. Movement toward tidewater from the mines is somewhat better, but even at that there is no surplus at the docks and the retail dealers have little in their bins. Everybody is being cautioned against a too optimistic view of the situation and are told to be conservative in the use of fuel for some time to come.

With a view of preventing a repetition of this winter's conditions, L. A. Sneed, one of Dr. Garfield's assistants, who has been placed in charge of coal distribution, held a conference here on Washington's Birthday with a committee of wholesale and retail dealers. Plans were discussed which provide for the storing of coal during the summer by the retail dealers, this coal to be used in an emergency. Details

concerning these plans will not be made public until they are submitted to Dr. Garfield. It is known, however, that they provide for the storing of the coal in a spot where it will be available without towing it through waters that might be filled with heavy ice. Another matter discussed was Dr. Garfield's proposed order affecting jobbers. The retail dealers expressed themselves as being decidedly against the decision of Dr. Garfield and were asked to submit a brief setting forth their views to the Fuel Administrator.

The Merchants' Association, through its Committee on Inland Waterways and Water Storage has asked the War Department to make a survey of the Delaware & Hudson Canal and the Morris & Essex Canal with a view of resuming their use as anthracite coal carriers. The Broadway Association has submitted a report to Mayor Hylan recommending among other things an enlargement of the bins of apartment houses, hotels and manufacturing plants to accommodate larger supplies of coal.

The inquiry of the Board of Aldermen's committee which started on Monday of this week, is expected to develop a plan by which the city can go into the coal-selling business. It was said by one of the witnesses that by licensing the dealers and buying and selling coal the city could stabilize the price and in that way benefit the public. It was also testified that during the four weeks ending Feb. 16 the coal delivered to cellar dealers amounted to 41,536 tons.

In the proposed plan for the proper distribution of coal suggested by the Brooklyn dealer an authorization card is issued for each building or subdivision thereof; 1000 lb. of coal shall be the maximum seasonal allowance for every 1000 cu.ft. of building, and 1000 lb. of coal shall be the maximum seasonal allowance for every 1000 sq.ft. of exposed wall area.

Taken as a whole, the New York market shows an improvement. Receipts, with the exception of one day when there was a heavy storm, show daily increases and most dealers have been able to take care of their trade in fairly good shape. Unless there should come a severe storm or intense cold weather no serious condition as the trade experienced a few weeks ago, is expected again this winter.

There continues to be little change in the anthracite steam coal situation. Owing to the moderate temperatures, consumption has not been heavy and dealers have a little more freedom in delivery.

Current quotations, per gross tons, f.o.b. Tidewater, at the lower ports are as follows:

	Circular	Individual
Broken.....	\$6.30	\$7.05
Egg.....	6.20	6.95
Stove.....	6.45	7.20
Chestnut.....	6.55	7.30
Pea.....	5.05	5.80
Buckwheat.....	4.30@5.00	5.50@5.30
Rice.....	3.75@3.95	4.50@4.80
Barley.....	3.25@3.50	4.00@4.25
Boiler.....	3.50@3.75	.....

Quotations for domestic coals at the upper ports are generally 5c. higher on account of the difference in freight rates.

Bituminous—Jobbers are thoroughly aroused over the proposed order which will practically put out of the coal business about 10,000 jobbers throughout the country and who, it is estimated, handle about 85 per cent. of the coal supply. The jobbers doing business in this market are bending every effort possible to secure a change or a cancellation of the proposed order, which, it is said, Dr. Garfield has decided to issue, or in ascertaining some means whereby, without violating the rulings of the Fuel Administration, they can continue in business and maintain the trade which had been built up, probably after many years of hard work.

With this latter idea in view a largely attended meeting of jobbers was held at the Whitehall Club on Monday of this week (Feb. 25), which was addressed by Gibbs L. Baker, a Washington, D. C., attorney, and who is the Washington council for the Wholesale Coal Trade Association of New York. Mr. Baker explained in detail the Fuel Administration law and what the proposed order, if issued, would mean. He said that he was of the opinion that with the order promulgated, the only way the jobber could remain in business and not violate the law was to act as a purchasing agent for the consumer, by making an agreement to purchase the coal at the fixed Government price, the consumer to compensate the purchasing agent for his services. It was further explained that the purchasing agent must have the

orders for the coal before attempting to make the purchase from the mine operator.

It was suggested that Dr. Garfield be asked to fix a definite percentage per ton, or other compensation to be paid said purchasing agent and that licenses be issued for such agents.

Local conditions show some improvement. There is no surplus supplies at the docks, but receipts have been larger. Demand continues heavy and all coal received here is apparently under orders as free coals remain out of the market.

Production which was reported as showing a 15 per cent. increase for the week ended Feb. 16 was slightly interrupted this week by floods; but these were not as serious as expected. Several mines, however, were closed because of high water.

Car supply is better, the mines along the Pennsylvania lines reporting about 10 per cent. of their requirements being received while those along the Baltimore & Ohio got about 20 per cent. of their needs. The mines along the New York Central received about 60 per cent. of their requirements. Some operators say that with 60 per cent. of the full car requirements available they would be able to flood the market with coal.

Nothing is heard regarding the making of new contracts for the coal year beginning Apr. 1, and it is the belief of many dealers that few, if any, will be signed, the operators deciding apparently to sell their product to anyone who desires it. The same rule, it is believed, will apply to the railroads, although it is expected the mine producing the quality of coal desired by the roads will naturally receive sufficient cars to furnish the coal needed.

Many plants in this vicinity continue to be short of supplies, but there is not the worry over future receipts that existed a couple of weeks ago.

The order issued by State Fuel Administrator Wiggin under date of Jan. 1 providing for six lightless nights each week was rescinded on Monday of this week to take effect Mar. 1, but Mr. Wiggin reminds the public that the order from Washington calling for two lightless nights each week, Sunday and Thursday, remains in force. Mr. Wiggin also rescinded his order of Jan. 2 in regard to reductions of light and heat for buildings.

PHILADELPHIA

Anthracite improvement continued by better weather. Demand still exceptional, with receipts fair. Authorities insist on good preparation. Public lessons in fuel conservation. Dealers annoyed by calls for statistics. Opposition to April reduction. Bituminous shipments short. Future promises improvement. Much coal confiscated. New price meeting with favor. Brokers at sea. Government distribution plans cause interest.

Anthracite—Springlike weather early in the week and quite liberal shipments, especially from the largest operating company, caused the dealers to think the winter's troubles had passed. Some of the smaller yards where the tonnage is not heavy were rapidly catching up with their deliveries. Late in the week another cold wave started the cry for coal all over again. Nevertheless conditions in general are much easier than at any time since last October, and the retailers, as well as the fuel authorities are giving much thought to the new coal year, which commences Apr. 1. Mr. Lewis seems determined not to allow the present large number of 230 yards to be increased, and again expressed the wish that they could be reduced to a dozen large, well-equipped plants scattered through the city.

This week the preparation of coal has been given more attention and publicity than for many months. Federal Trade Agent Sherman A. Cuneo is on the trail of dealers and anthracite operators who would disregard the orders against poorly prepared coal. Special efforts are now being made to have the coal properly prepared, inasmuch as the State Fuel Administrator is out with a strong statement to the public advising them to "store coal in the summer, the quicker the better." He says he is determined to spread his buy-coal-early propaganda so efficiently that more cellars than ever will be filled with next winter's supply during the spring and summer, when railroad conditions are ideal.

Dealers who accept inferior coal from the shippers will be obliged to prepare it properly and charge the cost of it to the operators. The battle for good coal is on and Mr. Potter assures the consumers they can safely buy it from now on. Already the inspectors are active and this week numerous dealers had shipments condemned and were forced to rescreen and otherwise prepare it before delivery.

to the consumer. The news reached the city this week that the fuel authorities in Luzerne County had closed down six small breakers because of failure to heed the injunctions to cleanly prepare coal.

The committee has also issued rules covering the amount of small coal allowed in the sizes from pea down as follows: Nut coal not to exceed 3 per cent. No. 1 buckwheat; pea coal not to exceed 3 per cent. No. 2 buckwheat; No. 1 buckwheat to be free from No. 3 buckwheat; No. 2 buckwheat to be free from dirt through 1/4-in. mesh. Smaller sizes to be considered dirt in these four sizes if exceeding the limits named.

This week the retail trade received letters from Chairman Lewis advising of word from Washington to the effect that local dealers will probably receive during the year commencing Apr. 1, 1918, the same amount of prepared coal and from the same sources, as in the corresponding period beginning Apr. 1, 1917. Then they are asked to supply promptly exhaustive figures showing all shipments in sizes and naming the shipper from April, 1916, to date. Most dealers are disgusted at being compelled to furnish so many details of their business, requiring as it does many extra hours of clerical work. While these calls for information have been many and varied, they are always responded to.

No definite information is obtainable as to whether there will this year be the usual spring reduction of 50c. per ton. In this connection it is important to bear in mind the statement made in the letter of Dr. Garfield to President Wilson, recommending the increase of 35c. in anthracite prices on Dec. 1 last, which letter was issued as a part of the order signed by the President. This statement is as follows: "In this connection I desire to say that it is my expectation to order the reduction in anthracite prices which has been regularly given, beginning Apr. 1, 1918." Despite this the dealers are decidedly against it, for as soon as such an announcement is definitely decided upon the dealers will be flooded with more orders than they can handle. With no positive assurance of what tonnage to expect and with the advance of 10c. each month for five months, they claim they would be placed in the same false position as last year. It is known that the various coal exchanges are opposing the reduction. Chairman Lewis, too, in answer to the question whether consumers could expect lower prices, tersely answered: "I hope not. It would result in great confusion." The question of reducing the gross margin of \$2.50 allowed retailers is still under discussion, but as yet the committee does not feel justified in reducing it.

While the agitation is on over the April prices many dealers are taking the opportunity to endeavor to align themselves with new shippers, beginning with the new coal year, with the hope that they may possibly be able to add at least another shipper to their list. While the calls of this kind are increasing of late, little encouragement is given, as no one knows at this time just what regulations the Government will put into effect.

Once more the question of reducing the number of prepared sizes to two has bobbed up. This time it was started by the recent convention of the retail coal men in Baltimore, who went on record as favoring it. It would be an innovation if the Government should order this change, which it is declared could be made with little trouble, as the screens for the new sizes are mostly on the ground, since the fiasco when the operators attempted it about two years ago.

Complaints from West Philadelphia consumers that local dealers are charging over \$10 a ton were analyzed by the local administrator and in each case it was found that with everything added, including jobber's commission of 20c. and independent's premium 75c., the rate could be justly charged under the law. There are some who claim the greatest questions before the fuel administration are the premiums allowed the independents and the commissions to brokers.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line Tide		Line Tide
Broken.....	\$5.90 \$6.05	Buck.....	\$3.15 \$3.75
Egg.....	4.80 6.00	Rice.....	2.65 3.65
Stove.....	5.05 6.35	Boiler.....	2.45 3.55
Nut.....	5.15 6.40	Barley.....	2.15 2.40
Pea.....	3.75 4.65		

Bituminous—The receipts of bituminous are still meager, with conditions about as they have been for a week past. The one encouraging feature is that the improvement in car supply that began about ten days ago gives evidence of continuing, but most mines are still without an adequate

supply. As has been the rule for some time, the operators are receiving the greatest number of cars to load for railway fuel and priority orders. Some operations complain that they have received barely any cars for free loading and claim it is unjust to confine them to orders of this kind, as they are thus compelled to neglect their commercial trade which has taken them years to build up.

All coal, except such as is still under contract, is now being sold at the new Government price of \$3.05 per net ton, including smelting coal, which now comes under the same price-fixing order. As times goes on the new price seems to meet with more general satisfaction, and it is thought it will do a vast amount of good in stimulating production. The brokerage trade also is using this price as a basis for their sales, with the commission added, but there continues to be much confusion among the commission trade regarding their status after Apr. 1, following the Fuel Administration order as to this feature of the trade. So far there have been no indications that the larger operators who, while maintaining sales offices of their own also sell a portion of their tonnage to brokers, will sell brokerage coal at less than the \$3.05 price. While there is much anxiety on the part of the brokers, we seem to feel that before Apr. 1 the situation will be adjusted to their satisfaction, as they have always formed a most essential part of the bituminous trade.

The news that the Government is working on a comprehensive plan for fuel distribution, by dividing consumers into four classes, was received here with a great deal of interest. It is understood the plan is being worked out jointly by the Fuel Administration, the Shipping Board and the Army and Navy Departments. It is presumed also that any such scheme as they adopt will conform to the plans already developed for shipping according to the zone in which the coal is mined. The zoning committee for this district is still busily at work in their office here, but progress has been much slower than expected, as the further they get into the subject the more complicated it has become.

It is also rumored that under the new shipping plans there will be a heavy curtailment of lake tonnage, especially that portion destined for re-shipment to the Far West, such as the Dakotas, which section of the country will be expected to draw their supplies from the mines in near-by states.

This week the United States District Attorney caused the arrest of the local sales agent of a West Virginia mining company, claiming that sales had been made at prices in excess of the Government maximum. The outcome of this case will be closely watched, as it is thought it will bring out rulings on many technical points of the price-fixing order which have not been clearly understood from the beginning.

The demand for coke continues to be far in excess of the supply, especially since the production for January was much below normal. However, it is thought that with better conditions as to price prevailing at the mines there will be a corresponding increase shortly in this branch of the trade.

BALTIMORE

Roseate statements from Washington about improved coal tonnage are not reflected in supplies here, where industries are barely skating through. Many schools still closed for lack of coal.

Bituminous—The coal trade here fails to reflect through actual fuel supplies the optimism of the roseate statement made from Washington at the outset of the present week that milder weather has brought an almost normal tonnage movement. For this territory the story is told at the diversion points of the Government in West Virginia and western Maryland, where Government preferential orders so far exceed the coal awhel at the eastern gateways that there is little or no chance for directly consigned industrial contract coal to get through unchanged from its original marketing. In this city numerous industries are just barely getting enough coal to operate, and a number have undoubtedly curtailed production through lack of fuel. The fuel administrator's local committee is still hard pressed at times to find enough fuel to go around to meet even the worst needs. One of the oddities of the past week was that at times there was much more coal on tracks here for export than for all other business combined, and yet this coal could not be loaded because there were no bottoms to receive it and much of it had been standing at tide for two weeks or more. Because it was export-price coal and could not be sold locally without a big loss, it had to remain idle while local industries

went without fuel. The jobbing interests here are still at sea over Garfield's commission-eliminating order, except that they feel that it will put jobbers out of business. Legal advice has been generally sought and the whole affair is likely to be plunged into the courts shortly.

Anthracite—Supplies here have been a little easier, but the demand is far in excess of the supply. Much milder weather brought less urgent call, and there was not so much necessity to divert industrial coal for domestic use. Thousands of homes here are still without coal of any kind, however. The lower grade schools of Baltimore have all been closed since before the Christmas holidays. Mayor Preston has appealed to Washington for fuel so the schools can be reopened, but while relief has been promised the coal has not as yet arrived.

Lake Markets

PITTSBURGH

Operators disappointed by continued poor car supplies. River open and supplies adequate locally. Opinion on prospective new price regulations.

Railroad conditions in the past week have been decidedly disappointing from the viewpoint of the coal operator, whom the reports of constantly improving traffic conditions had led to expect a large increase in car supplies. Instead, there has been practically no increase, and some mines have fared worse in the past week than previously. That the railroads have improved their own position is not denied. Doubtless they have done so by clearing up much of the congestion caused by loaded cars, but they have not improved the position of the shipper, who does not receive materially larger supplies of empties than formerly.

The Monongahela River continues open and coal is coming down rather freely, the mills depending on river coal now having little difficulty. With mild weather demand for domestic coal has slackened and there is not much difficulty in that quarter, so that the local situation is in fairly good shape. R. W. Gardiner, district distributor, has had added to his territory the mines on the Pan Handle division of the Pennsylvania. This covers the branch of the Pittsburgh seam that runs due west from Pittsburgh into Ohio.

The coal market is narrow, scarcely any free coal coming into the open market. It is ruled that when diversions of coal occur by order of the Fuel Administrator the recipient shall pay either the set price, plus the brokerage if a broker figures, or the contract price in case the coal had already come under the ownership of the original buyer, against a contract enforceable at law. The market remains quotable at the set prices: Slack, \$2.20; mine-run, \$2.45; screened, \$2.70, per net ton at mine. Pittsburgh district, subject to the addition of brokerage up to 15c., in case the sale is made by a regular broker.

There has been much discussion in local coal circles of the announcement that Apr. 1 prices will be revised and brokerage, to be added to the set price, eliminated. Some jobbers state that they are well satisfied with the prospect, thinking it probable that in the near future there will be a good supply of coal and some producers will be quite willing to pay a commission. In one quarter the prediction is even made that the open market will eventually decline below the set price. In the past, while consumers have not objected particularly to the paying of a brokerage, the difficulty has been to find the coal to sell him.

TORONTO

Coal situation still serious. Shipments coming in freely but insufficient for demand. Dealers generally refuse net orders. Local deliveries difficult and expensive.

The coal situation remains serious, several days of severe weather having greatly increased the demand. Coal is coming in freely at the boundary, and as the movement from there to Toronto is given preference over all other freight, considerable supplies are arriving. Dealers, however, generally refuse to accept orders on the ground that receipts are insufficient for new business and the filling of accumulated outstanding orders. In some cases coal is obtainable where purchasers are able to arrange for delivery, but the price is almost prohibitive, as teamsters in some instances charge as high as \$3 and \$4 per ton, as they are frequently obliged to wait for hours at the yards before they can

obtain loads. The city bureau is giving out small lots in cases of extreme necessity, but supplies for this purpose are so limited that many applicants are turned away.

Nominal quotations per short ton are as follows: Retail anthracite egg, stove, nut and grate, \$9.85; pea, \$8.85; bituminous steam, \$9; slack, \$8 to \$8.50; domestic lump, \$10; cannel, \$11. Wholesale f.o.b. cars at destination, three-quarter lump, \$7 to \$7.50, slack, \$6.85 to \$7.

BUFFALO

Return of mild weather helps the situation, but actual scarcity continues in all sorts of coal. Difficulty is laid to the railroads. Jobbers uneasy over last price order.

Bituminous—The supply is not good, but the situation improves slowly, owing to warmer weather. It is not likely that the scarcity of the past month or two will return right away, though the uniform report from the coal offices is that it is as hard to get a car of coal as it ever was. This section does not appear to have suffered much from the shortage. Some jobbers say that such factories as did run short occasionally would have done so anyhow, in order to make repairs and the like.

The main reason for the coal shortage—the lack of cars—does not appear to be improved, and it is still confidently affirmed that no regulation of the consumption or distribution can accomplish anything permanent till the car supply is better. The heavy snow is gone, and the zero weather is probably past for the winter; but with normal weather the movement is not enough to meet the demand. During the zero weather the car movement ran down alarmingly.

The latest coal order appears to have dropped the former regulation for thin vein slack and lump and now only mine-run is recognized. The mine price of \$3.20 recognizes no sizes, so no screening will be done of course. The Buffalo price will be \$4.30 on Allegheny Valley rail rate, \$4.40 on Bessemer district rate, \$4.45 on Pittsburgh rail rate, all per net ton f.o.b.

Anthracite—The supply has not been what it should be lately, but with the disappearance of freezing weather the consumption has dropped off about half and the distributors manage to keep ahead of the demand. It is a hard matter, with the consumers making it as bad as they can by ordering much more coal than they need.

DETROIT

Partial relaxation of restrictions follows easier condition in coal supply. Detroit pool will continue operations.

Bituminous—Favorable weather conditions throughout the week, with temperatures that have removed considerable of the snow, are reflected in a marked improvement in transportation conditions. Much of the freight congestion has been cleared away, permitting freer movement of coal shipments on roads south and southeast of Toledo. The result is an easier feeling among consumers of domestic and steam coal, with a satisfactory improvement in supply.

Because of the better condition of affairs, the Michigan fuel administration has partly rescinded the regulations that were put out Jan. 25. The order restricting operation of business places, stores, office buildings and other establishments to nine hours a day is revoked. Mr. Prudden, however, recommends that its observance be continued in smaller towns of the state. He retains in effect the rule restricting electric lighting and illumination Sunday and Thursday nights, and advises everyone to use coal as sparingly as possible.

Detroit's terminal coal pool is to be continued in operation. This announcement was made by Ford R. Cate, chairman of the pool committee, following conference with other pool representatives in Cleveland. Mr. Cate says many of the objections raised against the pool plan have been cleared away and that the records show the Detroit pool's efficiency was greater than that of similar bodies in other cities.

Anthracite—Shipments of anthracite are coming to the city in small volume, but improvement in weather conditions contributes in making the supply provide for a larger number of householders than heretofore, by making a smaller daily consumption possible in domestic heating plants. The coke supply continues scarce and not very much wood is available for fuel use, the larger part of the supply being green.

COLUMBUS

Continued mild weather still further relieves the stress of the fuel situation in Ohio. Railroads are hauling a larger tonnage.

The coal trade in Ohio has been in a much less precarious condition because of a larger tonnage being handled by railroads and reduced requisitions to take care of the domestic trade. Both factors have combined to relieve the strenuous situation that prevailed during the zero temperatures. Private users now have sufficient stocks, and manufacturing plants are able to accumulate a surplus. On the whole the situation is in much better shape, although another protracted cold snap would cause much inconvenience.

The retail trade is still attracting the attention of fuel committees in the various counties. Retailers are often compelled to limit deliveries to small lots and are prohibited from giving each customer all that is wanted. But there are many fewer cases for the county committees to investigate and stringent transportation orders are not now necessary. Retail prices are firm at the levels which prevailed for some time. Pocahontas is scarce and the same is true of anthracite.

Steam coal is also coming into the market in larger quantities. Practically all plants which were compelled to reduce production or suspend are now in operation. Schools now have sufficient fuel and some surplus stock. In fact steam business is in pretty fair shape, considering the war conditions and emergencies. Railroads are taking a large tonnage for the movement of trains.

Production in the state during the past week has been fairly good. Floods in the Hocking Valley have not passed, and the output in that district is estimated at 75 per cent. of normal. Jackson and Pomeroy Bend districts are producing about 65 to 75 per cent. of normal. In eastern Ohio the railroad situation is still bad and the output is correspondingly curtailed. About half of the coal loaded in that district is used for railroad fuel. In Massillon and Cambridge the output has been slightly increased.

Prices on short tons f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Sized grades.....	\$2.70	\$3.05	\$2.70
Mine-run.....	2.45	2.70	2.45
Screenings.....	2.20	2.45	2.20

CINCINNATI

Milder weather has checked demand, but the supply of coal remains extremely limited. Great care is necessary in distribution and consumption.

While milder weather now prevails, and the demand for coal has not been so insistent, yet the trade has been compelled to issue warnings to the public that the winter is not over, and that the greatest care must still be exercised in the distribution and consumption of coal in order to avoid possible suffering should colder weather return. An announcement from some official source that the coal supply in Cincinnati is now ample, and that all demands can be taken care of, was promptly contradicted by leading members of the trade, who declared that the supply is still so limited, as compared with consumption, that there is no reserve whatever; and that should severe weather be experienced the city would be precisely where it was a few weeks ago. The movement of coal from the mines has been improved since the melting of the snow and the better traffic conditions generally, but bunkers and coal bins were scraped bare during the past two months. As consumption is still heavy among industrial concerns, there has been no reserve whatever accumulated. Prices, for the most part, are based on contracts entered into before the Federal price regulations went into effect, and there is little spot coal offered. Should mild weather continue, there is every reason to believe that there will be a chance to get things straightened out; but there is no chance for cheap or plentiful coal this year, coal men declare.

LOUISVILLE

Coal movement shows considerable improvement in western Kentucky field, better car supply and better movement. Eastern Kentucky field improving slowly, due largely to car shortage.

There has been much improvement shown in the movement of western Kentucky coal. One Louisville house during the week received 20 cars at one time, the largest

volume of coal received at any one time in months. The labor situation in the western Kentucky district is now somewhat better than it has been, while the car supply is greater and the traffic movement faster. Local dealers have been well supplied, and practically every small dealer has two to four cars in his yards.

In the eastern Kentucky field conditions are little different from a week ago. There has been some slight improvement in the car supply and movement of cars, but labor is scarce and traffic conditions are not such that the production has shown any material increase.

Prices on all grades of coal remained unchanged during the week, but it is possible that some new prices may be announced in March to meet requirements of manufacturers and for summer stocking.

Inquiries have started coming in relative to prices on new business from manufacturers, who are now beginning to run short on their contracts, which are generally arranged to expire about Apr. 1. Heavy summer stocking is also expected from the thousands of residents who were caught without coal this year, and who have been telling the coal dealers what they expect to do this summer. However, no one apparently knows what conditions will be in the late spring, and the Fuel Administration is not figuring on summer prices this early in the year, but endeavoring to get the whole country fairly well supplied first.

The local demand for coal from the retail standpoint has been fairly active, but apparently consumers are endeavoring to run out on as little coal as possible, while awaiting a lower market. Numerous orders are coming in for 1½-ton lots. Heretofore dealers were in the habit of charging one-half of the ton delivery price, plus an extra charge of 25c. on half-ton deliveries. However, the Fuel Administration has refused to allow the dealers to make this extra charge for half-ton lots, and as a result many retailers are refusing to deliver less than ton quantities, figuring that it is unprofitable business to deliver half-ton lots on the present basis.

BIRMINGHAM

Inquiries for lump coal not so insistent, but steam demand has not slackened. Production hampered by local strikes. Car supply reported good.

While domestic dealers are still urging shipments from the mines, the demand is not insistent, as all retailers now have stocks on hand and the mild weather is holding down consumption.

Inquiries for steam coal continue strong and there are no indications of any adequate relief being afforded by increased production, even if the output was normal, which is not the case at this time. There is an ample supply of cars, but the shortage of labor and irregularity on the part of mine operatives curtails production materially.

The strikes called at a number of the larger mines of the district by union leaders, which have been in effect at some collieries for two weeks or more, seriously lowered the output of the district, but conditions are now improving rapidly and the indications are that normal complements of men will report for work during the present week.

Coke

CONNELLSVILLE

Disappointment at car supplies. Coke shortage 100,000 tons weekly. Railroads clearing congestion rather than furnishing empties. Light market offerings.

Car supplies in the Connelleville region last week averaged little, if any, better than in the two weeks preceding, and this week opened with somewhat lighter supplies than at the beginning of last week, only about 60 per cent. on the Monongahela R.R., against 70 per cent. Monday of last week, this being a poor augury for the rest of this week. It appears, therefore, that there have now been three weeks of shipments averaging 280,000 tons a week, which is about 100,000 tons a week less than conservative estimates of the amount of coke regularly required to supply the blast furnaces dependent upon the region. As to the proportion of foundry coke to requirements there are no precise estimates. With the widespread inquiry in the open market for foundry coke, coupled with the fact that the leading foundry coke producer has had very light car supplies for weeks past, the position is rather complicated.

Coke operators were decidedly disappointed last week at the poor car supplies, after nearly a fortnight of very favorable railroad weather, and this week the feeling is turning to one of discontent. For a time operators were patient and were quite willing to accord the railroads a fair amount of time in which to get into good running order with the favorable weather that has prevailed, but now the appearance is that the railroads have been putting their whole effort upon moving cars through and paying little attention to getting back empties. Doubtless they have greatly reduced congestion on their lines, but this does shippers no good when they cannot ship increased quantities of material.

The market is a narrow one. There is scarcely any coke offered, loaded on Pennsylvania or B. & O. equipment. Frequently there are offerings of P. & L. E. cars, but few consumers are in position to take coke thus loaded. These, however, generally find a place for any coke that is offered. The market remains quotable at the set prices: Furnace, \$6; 72-hour foundry, selected, \$7; crushed, over 1-in., \$7.30, per net ton at ovens.

The Connellsville "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Feb. 16 at 240,772 tons, an increase of 16,627 tons, and shipments at 285,359 tons, an increase of 9452 tons.

Buffalo—The jobbers in the coke trade find it practically impossible to obtain a supply from the regular ovens, as to do so would be to obtain it at the Government oven prices of \$6 and \$7 per ton. So far none seems to have been sold in this territory at those prices. The furnaces all depend on their contracts for their supply. Jobbers sell quite an amount of byproduct coke to all sorts of consumers, for the purpose of piecing out the coal supply. Prices run from \$1.50 for the lowest form of coke breeze to about \$3 for the assorted sizes. The demand far exceeds the supply.

Middle Western

GENERAL REVIEW

Prominent coal jobbers see danger ahead if the contemplated price differential is eliminated between producer and jobber.

The decision of the Federal Fuel Administrator to wipe out the spread of 15c. per ton that has existed between the producer and jobber is causing much speculation and considerable discussion throughout the Middle Western section. For several months it has been no trouble for the producer to get all for his product that the Government would allow him to charge. His sales office, however, had to be careful, or else his organization would become loaded with orders that could not be filled, because of the constant placing of embargoes by transportation companies. Many producing operators who have always maintained an expensive sales organization have felt that there should be no differential, and that they should be allowed as much for performing the same service as the jobber got, 15c. per ton. If the jobber is to maintain a place in the coal industry it would seem that it would be necessary that he become allied with some producing company, and arrange to handle its coal, or at least a portion of it.

The market throughout the Middle West is somewhat relieved because of the improvement in transportation, the direct result of the warm weather that has prevailed during the past week. The domestic demand appears to be easy, but there is a strong market for any grade of coal among the manufacturing industries. The trade feels that the crisis is past and that there will be a decided improvement in the situation.

CHICAGO

Warm weather saves domestic fuel and improves transportation.

The tense fuel situation that has prevailed for weeks has been relieved by the advent of milder weather. Household requirements averaged less than they have for any previous week since Dec. 1. Industries have been able to buy more Illinois and Indiana steam coal than at any other similar period for a long time. Many large industries have been on a hand-to-mouth ration for months, and have been able to get only an occasional car—when it happened to escape the eye of some fuel administrator, either at destination or en route.

No noticeable improvement in the supply of coal from the East is evident. The receipts of Eastern bituminous coal are particularly limited, with a little better supply of hard coal from that direction.

A determined movement now seems to be under way to get a better supply of Eastern coal for Chicago. The Chicago Association of Commerce and the Building Managers Association are working in harmony with the retail dealers toward this end.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars at mines:

	Williamson and Franklin	Saline and Harrisburg	Fulton and Peoria	Springfield	Cartersville	Grundy, La-Salle, Bureau and Will
Steam lump.....	\$2.65@2.80	\$2.65@2.80	\$3.00@3.15	\$2.65@2.80	\$2.65@2.80	\$3.35@3.50
Domestic lump.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Egg or furnace.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Small egg or nut.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Stove.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Chestnut.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Pea.....	2.65@2.80	2.65@2.80	3.00@3.15	2.65@2.80	2.65@2.80	3.35@3.50
Washed egg.....	2.65@2.80	2.65@2.80	2.65@2.80	2.65@2.80	2.65@2.80	3.35@3.50
Washed stove.....	2.65@2.80	2.65@2.80	2.65@2.80	2.65@2.80	2.65@2.80	3.35@3.50
Washed nut.....	2.65@2.80	2.65@2.80	2.65@2.80	2.65@2.80	2.65@2.80	3.35@3.50
Mine-run.....	2.40@2.55	2.40@2.55	2.75@2.90	2.40@2.55	2.40@2.55	3.10@3.25
Screenings.....	2.15@2.30	2.15@2.30	2.50@2.65	2.15@2.30	2.15@2.30	2.85@3.00
Washed slack.....	2.15@2.30	2.15@2.30	2.50@2.65	2.15@2.30	2.15@2.30	2.85@3.00

	Clinton and Sullivan	Knox and Greene	Eastern Kentucky	Pocah. and W. Va.	Penna.	Hocking	West Va. Splint
Dom. lump.....	\$2.65@2.80	\$2.65@2.80	\$3.10@3.25	\$2.60@2.75	\$2.70@2.85	\$3.05@3.20	\$2.85@3.00
Steam lump.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85	3.05@3.20	2.85@3.00
Egg.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85	3.05@3.20	2.85@3.00
Small egg or nut.....	2.65@2.80	2.65@2.80	3.10@3.25	2.60@2.75	2.70@2.85	3.05@3.20	2.85@3.00
Mine-run.....	2.40@2.55	2.40@2.55	2.85@3.00	2.45@2.60	2.45@2.60	2.70@2.85	2.60@2.75
Screenings.....	2.15@2.30	2.40@2.55	2.60@2.75	2.10@2.25	2.10@2.25	2.55@2.70	2.35@2.50

MILWAUKEE

Springlike conditions improve the coal situation. Future supplies to be closely controlled.

The close of February finds the coal situation in this section of the country much easier. The return of warmer weather has relieved the tension of apprehension engendered by the prolonged cold spells of the past; and dealers and consumers are seemingly satisfied that the days of trial are over, for the present at least. Transportation conditions are growing better daily and coal is going forward to the interior more freely. Roadway conditions in the city and vicinity are still poor.

Anthracite, which was pronounced sold up two weeks ago, is still being delivered, and cases are reported where people who had been refused hard coal on former orders had been voluntarily offered anthracite by dealers. This would indicate that the anthracite stock had been too strongly conserved under the stress of continued below-zero weather.

The failure of Illinois to furnish its usual quota of coal at this season of the year has increased the draft upon stocks at Lake Michigan docks to such an extent that they will have to be supplemented liberally if vital industries are to be maintained until the opening of Lake navigation about Apr. 25. At a conference in the office of W. H. Fitzgerald, state fuel administrator, which was participated in by representatives of every dock company on the west shore of Lake Michigan, it was decided that about 40,000 tons will be needed to accomplish this end. A telegram to that effect was accordingly sent to the Federal Fuel Administrator at Washington, D. C. The coal desired amounts to 850 carloads, divided as follows: 300 cars Youghiogeny or splint screened lump; 350 cars Hocking screened lump, and 200 cars Hocking or No. 8 screened lump.

ST. LOUIS

Coal more plentiful from Standard fields, owing to warmer weather. Railroad facilities show little improvement. Car supply not good and working time consequently short. No outside coals coming in.

Whether conditions in this territory have eased the local situation, and there is apparently plenty of Standard coal to take care of normal requirements. In a general way storage coal is being acquired by both dealers and steam plants.

Railroad facilities are not so good as were to be expected in view of the weather, and in some instances coal has been delayed for four or five weeks. The terminal situation shows little signs of improvement. There is some improvement on all roads, except the Louisville & Nashville and Illinois Central. The Illinois Central still shows a lack of efficiency in the handling of full loads and the return of empties to the mine.

The Cartersville field shows some improvement, but not to the extent that any great tonnage of this coal is coming into this market. The railroads are still drawing heavily on that tonnage, and the Government requirements seem to increase instead of diminish. Working conditions are fairly good.

In the Mt. Olive district there is plenty of domestic coal for the St. Louis market for the first time in many months, largely because the equipment is restricted to St. Louis proper and that on the short-line roads equipment is somewhat plentiful.

The railroad tonnage still continues heavy from this district, and the demand for the Omaha & Western territory is good. Close by, however, there has been a falling off in the demand.

The condition in the Standard field is somewhat complicated on account of the car supply, but shows improvement in a general way. The Mobile & Ohio is short of equipment. Much of this is in the south and there is lack of motive power to bring it north.

Retail conditions are easy, and the coal situation in this territory is one that does not occasion any worry on the part of those charged with its supervision.

The prevailing market, per net ton, f.o.b. mine, is:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump.....	\$2.65@2.80	\$2.65@2.80	\$2.65@2.80
3x6-in. egg.....	2.65@2.80	2.65@2.80	2.65@2.80
2x3-in. nut.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 2 nut.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 3 nut.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 4 nut.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 5 nut.....	2.15@2.30	2.15@2.30	2.15@2.30
2-in. scrags.....	2.15@2.30	2.15@2.30	2.15@2.30
2-in. lump.....	2.65@2.80	2.65@2.80	2.65@2.80
3-in. lump.....	2.65@2.80	2.65@2.80	2.65@2.80
Steam egg.....	2.65@2.80	2.65@2.80	2.65@2.80
Mine-run.....	2.40@2.55	2.40@2.55	2.40@2.55
Washed:			
No. 1.....	\$2.65@2.80	\$2.65@2.80	2.65@2.80
No. 2.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 3.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 4.....	2.65@2.80	2.65@2.80	2.65@2.80
No. 5.....	2.15@2.30	2.15@2.30	2.15@2.30

Williamson & Franklin Co. rate is 87½c.; other fields, 72½c.

General Statistics

NORFOLK & WESTERN RAILWAY

Below is a statement of the coal tonnage from mines on the Norfolk & Western Ry. and from other railroads, for the month of January, 1918:

From	Net Tons
Pocahontas field.....	958,057
Tug River field.....	208,122
Thacker field.....	207,397
Kenova field.....	94,139
Clinch Valley field.....	127,802
Other Norfolk & Western fields.....	14,283
Total Norfolk & Western fields.....	1,609,800
Williamson & Pond Creek R.R.....	123,118
Tug River & Kentucky R.R.....	43,796
All other railroads.....	91,802
Grand Total.....	1,868,516